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ORIGINAL ARTICLES.

EXPERIMENTS TO DETERMINE THE VALUE OF FORMALIN IN INFECTED WOUNDS OF THE EYE.

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THE object of the experiments herein detailed was to discover the value of formalin in the local treatment of streptococcus infection of the ciliary region and the vitreous chamber in rabbits. They were inspired by the recent publication, by Dr. C. C. Barrows, of a case of general streptococcus infection following labor in which formalin, 1 in 5,000, was used as an intravenous injection. These experiments were conducted in the Physiological Laboratory of the College of Physicians and Surgeons, New York.

By way of ascertaining what effect a comparatively strong solution of formalin would have upon the vitreous body, 10 minims of a 1 in 500 solution were injected into a normal vitreous. Outside of the temporary increase of tension and haziness of the cornea produced by the induced glaucoma, no evil effects whatsoever were observed. The glaucomatous symptoms disappeared in about ten minutes and on the following day no sign of the injection was visible. From this it is obvious that formalin in the above strength has no disintegrating effect upon the vitreous of rabbits.

Infection of Rabbits' Eyes.—Colonies of pure streptococci were placed in water in sufficient quantity to make it perceptibly turbid. This was injected into the vitreous of the rabbits' eyes with a hypodermic needle as follows:

January 30, 1903.—I. White buck. Three minims of the solution of pure streptococci were injected into the vitreous behind the sclerocorneal margin. Ten minutes later no signs of reaction were visible in the eye. II. Spotted buck. Three minims of the above solution were injected into the vitreous. No reaction was noticeable in ten minutes. III. White Buck. Injected as above. No immediate reaction.

Results.—January 31.—I. Circumcorneal injection; iris swollen; lymph stretching across the pupil and exudate at bottom of anterior chamber; fundus hazy; mass of exudate in vitreous humor just under site of injection. II. Slight circumcorneal injection; iris swollen; exudate in pupil; faint reaction of iris to light; fundus hazy with flamiform exudate visible in the anterior part of vitreous humor. III. No reaction visible externally; iris clear and responds to light; fundus clear except in region where injection was made where a mass of greyish white exudate is seen.

It is obvious from the above that the injection of streptococci produced uveitis with exudation into the pupil and vitreous humor in the first and second rabbits. This unquestionably was an infection. The third rabbit showed no iritis or corneal injection but there was a slight exudate in the vitreous. The infection here was milder but it existed.

Beginning of Formalin Injections.—February 2.—I. Iritis better and exudate slightly less. No treatment. II. Status about the same as last noted; exudate general in vitreous chamber. Five minims of formalin solution, 1 in 5,000, injected into Tenon's capsule. III. Status about the same as on January 31. Marked exudate in vitreous. Five minims of formalin, 1 in 5,000, injected into vitreous chamber.

February 4.—I. No iritis and the vitreous opacity appeared less marked. In this animal it will be remembered that no injection of formalin was made. II. Iritis much improved; opacity in vitreous slightly diminished; eye better. In this animal the injection was made in Tenon's capsule. III. The iritis appeared diminished but the vitreous was very cloudy and little or no reflex could be seen. Formalin injection was made into the vitreous in this animal.

It will therefore be seen that the eye which was not treated had improved a great deal. The eye which received the injection of formalin in Tenon's capsule was improved somewhat. But the third eye (which had the injection in the vitreous) had improved as to the iritis but the posterior inflammation was worse. On this date, February 4, the injections were repeated in rabbits I and II but discontinued after that date until February 9.

February 9.—I. Still improving; exudate becoming less but still visible. II. No iritis; exudate in vitreous less and apparently settling to bottom of vitreous chamber. III. Exudate still visible; more marked than in rabbit II. Injections were repeated on this date. The eye of rabbit I, which had not been previously infected, was now infected with streptococci as before described.

February 11.—The newly infected eye of rabbit I was in a bad state; purulent conjunctivitis; iritis; cloudy vitreous and fundus invisible, the originally infected eye was still improving. Formalin injections were repeated in rabbits I and II, the status of which was apparently unchanged.

February 13.—Newly infected eye of rabbit I is destroyed by panophthalmitis. Exudate in the original eye almost entirely gone. Rabbit II, the one in which the injection was intracapsular, was much improved; fundus visible and exudate sinking and being gradually absorbed. III. Eye practically in state of panophthalmitis; 1 in 1,000

formalin solution injected. 1 in 1,000 formalin solution was now used in rabbit II into the capsule as usual and in III into the vitreous.

February 16.—I. Right eye improving; exudate scarcely visible. Left eye, fundus invisible but external signs subsiding. II. Still improving; fundus clearly visible except below. Formalin injection 1 in 1,000 in capsule. III. Iris bombé; fundus invisible and reflex yellowish but external signs again subsiding. Injection of 1 in 1,000 formalin into vitreous.

February 18.—I. Right eye almost clear. Left eye destroyed; posterior synechiæ; yellowish reflex in pupil; tension -2; external inflammatory signs such as conjunctivitis and pericorneal injection gone. II. Fundus still clearing up; intracapsular injection of 1 in 1,000 formalin. III. Hyphema; about same picture of destruction as exhibited in left eye of rabbit I. Injections discontinued.

February 20.—I. Right eye shows clear fundus. Left eye destroyed. II. Improving; fundus almost clear. Formalin injection into capsule 1 in 1,000. III. Destroyed.

It will thus be seen that the right eye of rabbit I infected by five minims of a turbid solution of pure streptococci recovered without any treatment whatsoever in twenty-one days.

The fundus in rabbit II finally became clear. This animal infected in the same way recovered in a trifle longer time after injection into the capsule of 1 in 5,000 formalin, subsequently supplemented by injection of 1 in 1,000 formalin.

The eye of rabbit III was obviously doomed on the seventh day and was hopelessly destroyed in fourteen days. On the fourteenth day the formalin was increased to 1 in 1,000, and rabbit II seemed to recover more rapidly thereafter, but it made no difference in the course of destruction of the eye of rabbit III.

The right eye in each case was originally infected but at no time during the three weeks were there any signs of sympathetic irritation or inflammation.

On February 9, the left eye of rabbit I was infected with the same pure culture and that eye went swiftly to destruction.

It will be seen that the eye with the vitreous injection of formalin ran an uninterrupted course to destruction while the eye with the intracapsular injections recovered. This latter fact would have led to definite hopes of good results from capsular injections had it not been for the more rapid recovery of the eye which had no injections at all.

Second Set of Experiments.—Some of the original colonies of streptococci were now transplanted and the strong vigorous growth obtained was used in a second series of experiments. The new colonies seemed to possess greater virulence than the older ones.

The vitreous of three rabbits was infected as before. In one no treatment at all was employed and in the other two formalin solution 1 in 1,000 was injected into the capsule of Tenon. All three eyes commenced to go the way to destruction in twenty-four hours after infection, although formalin injections of the above strength were used in the capsule at intervals of twenty-four hours in one rabbit and forty-eight hours in the other; all the eyes had become hopelessly lost by panophthalmitis by March 25.

Experiments with Infected Wounds of Ciliary Region.—So far the vitreous chamber alone had been infected and it was then determined to make wounds in the ciliary region with some rough object infected with the streptococcus solution of the second growth.

The eyes of two rabbits were infected by making a penetrating wound just behind the sclerocorneal margin with a rough pointed nail which had been previously dipped into the streptococcus solution.

March 31.—Brown rabbit shows marked infection with chemosis, iritis, (no exudate); 1 in 1,000 formalin solution (10 minims) were injected into the capsule. The yellow rabbit shows very slight reaction with a little redness and bulging over the site of the infection. No formalin treatment.

April 1.—Brown rabbit, panophthalmitis; chemosis; pupil filled with exudate. Yellow rabbit; practically no sign of irritation. Reinfected.

April 2.—Brown rabbit's eye destroyed. Yellow rabbit's eye seriously infected, with exudate in the pupil; chemosis. Injection of 10 minims of 1 in 1,000 formalin into capsule.

April 3.—Yellow rabbit; eye worse; great chemosis and anterior chamber filled with exudate. Eye lost.

Conclusions.—It seems fair to draw the following conclusions from the above detailed experiments:

1. Formalin, 1 in 500, may be injected into the vitreous of rabbits without producing more than momentary disturbance of the eye.

2. It is possible to cause panophthalmitis and consequent destruction of the eyes of rabbits by injecting three minims of a turbid solution of streptococci into the vitreous.

3. It is possible to produce the same result by infection in the ciliary region caused by penetrating wounds with infected pointed instruments.

4. Infections of the vitreous and ciliary region do not necessarily cause destruction of the eye. At times the infected eye recovers spontaneously, the inflammatory symptoms gradually subsiding.

5. Formalin, 1 in 1,000, when injected into the vitreous, exerts no influence on streptococcus infection of the vitreous.

6. The results of these experiments warrant the treatment of commencing infections of the eye by injections into the capsule of Tenon of 1 in 1,000 or even 1 in 500 formalin solution.

Remarks.—In view of the large quantity of infected material injected into the eyes of these rabbits it is possible that the results would have been more favorable had the injections of formalin been made more frequently.

It will be remembered, the statement has been made that in the first experiment the rabbit which had no treatment and the rabbit which had the intracapsular injections recovered completely. This is true but it is proper to state that there remained a very slight opacity apparently in the posterior part of the lens, or on its posterior capsule in each animal. This was probably due to the injury to this structure by the hypodermic needle, for it is quite impossible to perform the above detailed manipulations without struggles. This was the case with all our animals notwithstanding the free use of cocaine. It is also possible that these opacities were deposits of lymph on the posterior surface of the lens such as are frequently observed after certain types of inflammation of the uveal tract. In all other respects these eyes were normal.

"THE HEART CURE;" ITS TERMINOLOGY, PURPOSES AND ACHIEVEMENTS, INCLUDING THE ETIOLOGY OF FATTY DEGENERATION.

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I KNOW of no therapeutic method within the realms of the healing art that has been more misunderstood, and, as a consequence, greater injustice has been done it than that one salvation of the victims of cardiac disease, which has so unfortunately been termed "The Heart Cure." To many superficial observers the name alone condemns it, for a *cure of organic heart lesions* is absurd on the face of it; hence by too many it is associated with the most temporary of palliative measures. Other misled practitioners have fixed ideas that only palliative and temporary sustaining measures are justifiable in the treatment of broken compensation, and actually display not only a lack of sympathy with a systematic treatment, but too often even a spirit of antagonism to the consulting physician, who proposes and superintends the "cure," is manifested.

The term *Nauheim treatment* is not very applicable to the methods, as I now apply them in New York, and even differs somewhat as applied to-day, by the different physicians in Bad Nauheim, Germany. The name "Schott Methods" applies very well to baths and exercises as I have in the past applied them at Bad Nauheim, and would to-day, if there. But, firstly, the artificial bath varies from that at Bad Nauheim, and, secondly, the bath and exercises now constitute but an integral part of the methods I now employ. Thirdly, the association of the Schott name is offensive to those who dispute Prof. Schott's claim, as one of its discoverers. So pending the general acceptance of a better name we must be content with *The Heart Cure*, as it is so universally termed in Europe.

The true aim of the modern "heart cure" is strictly speaking, neither as a palliative measure or a cure of a heart lesion. It undertakes to restore and maintain the heart's compensation, and with it the health of the dependent body. As I expressed it several years ago[12] "The recuperation of an impaired organ or group of organs is possible inversely as existing obstructions impending or arresting their normal activity may be removed." On this law the treatment is largely based.

The sufferer from heart disease, when the consultant is called in, is generally extremely low. The demands of the declining body have caused the attending physician to continually whip up the lagging heart with digitalis, strychnine, etc., until it can maintain compensation no longer and it is found in extreme fatigue dilatation and exhaustion (the cyanosis, cachexia, dyspnea and cough first greets the attention). Metabolism, especially *katabolism*, is almost nil, so depressed is the general oxidation. Anuria is pronounced, edema is quite general, jaundice is often extreme and general manifestations of autotoxication accompany the subnormal temperature, the thready pulse and perhaps a Cheyne-Stokes respiration. The family and near relatives who have gathered about the one who has perhaps for years gradually attained this low condition, have been told by the attending physician of the near approach of death and they have been prepared for the worst. Such is the situation when in ignorance of all this, the consultant is called in to do whatever is possible to prolong life and make it worth living. He has but one thought, the alleviation of suffering, at first, but as conditions improve, he commences measures of systematic and progressive treatment. As the patient continues improvement, the patient and the family begin to think about the unfavorable diagnosis, the attending physician begins to feel embarrassed, and soon he associates his troubles with the incoming of the consultant, from whom he becomes more and more alienated and estranged. These unfortunate diagnoses constitute another detraction from the popularity of the *heart cure*.

A statement by Rosenstein,[9] in 1876, of the expectant course, in *insufficiency of the mitral valve*, very well describes it, as it occurs to-day, up to the point when heart cure methods are begun, and its final termination at the time the statement was written, prior to the reformation in cardiotherapy. "The course of the disease is such that the symptoms of stagnation assume a permanent character, and all the more so in proportion to the greater number present. Though at first it is generally possible to reduce the palpitations and dyspnea by suitable diet and drugs, and temporarily even to remove all edema, yet, after a long period of alternate relatively good health and total incapacity for work, the patient becomes gradually anasarcous and exudations begin to fill up the serous cavities and impede the respiration. Bronchitis, which is always present, increases the cyanosis and whether it be accompanied or not by a pulmonic induration often developed toward the end of the disease the usual termination is edema of the lungs. In a few isolated cases the actual though distant cause of death is embolic obstruc-

tion in the cerebral vessels and its usual results, or extensive apoplexy." The death period of the old plan of treatment is commonly the one selected for calling in the heart specialist of to-day, thus terminating a period of marked decline, and a co-incident failure of the heart to further respond to cardiac tonics and stimulants, and, generally, after a goodly collection of resultant complications from vicious cycles have materialized.

My first effort in such a case is to utilize a stimulant, the effects of which have not been already "worn out," to continue the heart action, and simultaneously I begin to lessen the work of the heart and neutralize and eliminate the acid, colloid and fatty products of fatigue and suboxidation. This first effort is a temporary one, and is calculated simply as a sustaining measure, until the real treatment can be sufficiently developed to relieve the requirements for continuous stimulation. These measures are also augmented by others, reinforcing them, such as massage, warmth to the extremities, etc.

The heart cure *per se*, as I administer it, is entirely based upon a few essential physiological and pathological principles, upon which I am convinced its success entirely depends.

Present time and space at my disposal will not permit an exhaustive exposition of these basic principles, but I will briefly state that a healthy or sound heart muscle can easily, other factors being equal, maintain compensation against almost any heart lesions, embarrassing the cardiac function. My assistants, at my clinic at Bellevue Hospital, will bear me out in the statement that a recent male patient of good muscular development, who on examination at the clinic proved to have murmurs of both the aortic and mitral orifices, was daily engaged at hard labor in the subway, at which he continued after his discharge from my service. Many other laborers with more or less severe heart lesions follow their several laborious avocations, though irregular, from occasional periods of incapacity from broken compensation, from which they quickly recover upon the hospital administered *heart cure*.

Course History of Decompensation.—A heart embarrassed in its function by an orificial stenosis or a valvular deficiency is accordingly crippled, and an individual dependent upon such a heart must be accordingly considered as a person of tantamount shortened limitations, their capacities for physical exertion, endurance, bodily abuse, digestion of food, overcoming obstacles and complicating diseases, are all lessened. Intercurrent complications, as colds, fatigues, worries, anxieties, griefs, indigestions, etc., that would not seriously embarrass the vitality of an organically sound man, will quickly wreck the compensation of one embarrassed by a heart lesion. The lowered arterial pressure is easily impeded to a vital point, by the undue resistance conferred by the unequal distribution of the blood, as caused by chill, thus congesting some parts and depriving others of a sufficiency, by general circulatory stagnation of mental and nervous depression, and the deficiency of oxidation incident to muscular, mental or nervous strain. One of the first indications for relief of cardiac stress and the recuperation of the muscular function is the application of the law recapitulated at the beginning of this article, namely the equalization and entire clearing of the arterial, capillary and venous systems, especial attention being given to the pulmonary, portal and renal circulations, the obstruction of which most commonly and seriously embarrasses the freedom of the circulation.

The above quoted statement of the common course of ordinary cardiac cases, by Rosenstein, very well describes the effects of continually suffering the many pitfalls of a careless or ignorantly spent life, and its certain ultimatum. These the heart cure endeavors to prevent.

As an essential part of my plan of conservation of the patient's energy, which includes, in addition to a very careful dietary which utilizes the digestive powers to best advantage, in the ingestion and digestion of the most nutritious foods; limited to those which can be promptly digested without fermentation or perceptible putrefaction, I always restrict or entirely prohibit sexual intercourse.

PATHOLOGICAL MORPHOSIS.

All tissues are composed of cell units which are continually undergoing destruction and reconstruction (katabolism and anabolism). The circulation of the blood and oxygenation is vital to this metamorphosis (metabolism), in both its aspects. The transmission of the elements of nutrition is so well understood as to be duly recognized by all, but either from ignorance or prejudice, the subject of *katabolism* has been at all times and in all connections grossly neglected, to say the least. Most physicians will readily ejaculate that katabolism is not new to them, but when interrogated on its morphosis they prove to be not only in ignorance but directly question the truth of my allegations. Moreover the text-books are comparatively non-committal upon the details of this subject, and only by much research, can it, even by the collection of widely scattered titbits be verified.

I have by years of study and observation worked out the fact that all tissues which are deprived of a sufficiency of oxygen for that continuous combustion which imperceptibly but adequately consumes the effete eliminations from cells and the detritus of physiological cell disintegration, undergo a changed course from that observed during normal oxidation katabolism, which is characterized by radical changes in both their chemistry and their morphosis. Either by virtue of some form of suboxygenation *per se*, or suboxidation, as due to a deficiency of the necessary supporters of oxidation, namely alkaline environment and active oxidases, the results are the same. The tissues manifest a sluggishness and a reversion toward that rudimentary type of tissue, which is mostly observed in those fundamental forms of protoplasmic life (in the group intervening the monera or amebæ and the medusæ) and which

are more exposed to environmental irritations and other vicissitudes than are the higher forms of life. This tissue change differs from the normal, firstly by an increase in the size and number of cells, as a result of the stasis of katabolic oxidation, and in the presence of a continuous anabolism. The collagen of the cells is first set free during the general protoplasmic gelatinization (which characterizes its structural dissolution), part of which exudes, the balance, together with water, either absorbed from the blood or lymph, or formed during the pathological metamorphosis by hydration, combines with the protoplasm forming the characteristic gelatiniform tissue; the ultimate change of which, according to its environment and conditions of situation, being a fatty or putrefactive one, or a combination of the two. The former being the dryer one and apparently due to a synthesis of carbon and hydrogen, as set free in the incomplete formation of carbondioxide and of water. The latter being one perhaps expressing a greater excess of hydrogen and hence of water formation. However, it should be admitted here that this is mere conjecture unsupported by experiments. The sources of the water are hardly possible to determine in the living subject. Many aromatic and other toxins are, however, formed by this metamorphosis, which are not produced by normal katabolism. It is also of interest in this connection that fatty degenerations are invariably the consequence of suboxidation, whether in living tissue, dead and decayed flesh, or in the ripening of cheese. Obesity in mankind is caused by diminished arterial caliber, carbonic oxide and dioxide poisoning, tissue deprivation, owing to the counter oxidation of higher combustibles, namely ingested alcohol, arsenic, phosphorus (in toxic doses), lead, mercury, etc., which are burned in the liver, thus depriving the liver cells and thereby causing their fatty degeneration, slow asphyxiation, oxidase incapacity of impotent and castrated men and animals, and during undevelopment, maldevelopment, and temporary and permanent exhaustions and obsolescence of the sexual glands, of vices and excesses, and in menstruation, pregnancy, the puerperal period, lactation and after the climacteric, fatty and other suboxidative tissue changes are frequent. In stall fattened animals and Strasbourg geese, owing to their being deprived of a sufficiency of both air, light and exercise, fatty degeneration, general and hepatic, are the rule, especially in the liver in geese. In hibernating animals much fat is accumulated during the winter's sleep, when oxidation is almost nil, and mostly in and about the voluntary muscles where oxidation is the lowest.

The hypercombustion of the general oxygen supply of the body, as observed in hyperexias is responsible for depriving the tissues of sufficient oxygen and thus causes the fatty degeneration so frequently found in cases of prolonged high fever.

In the deficient oxidations of senile degenerations, fatty changes are observed, as well as the general fibrosis, also from subkatabolism. Tissues in an *acid* environment suffer a fatty change as distinguished from an *oxidation*, which is favored by *alkaline* media. The blood is always more fatty in the veins than in the arteries, and it might be added that putrefaction is never observed in *oxidized* (arterial) blood, but solely in the venous blood, when at all.

Atheroma of vascular walls occurs only where the oxygen supply to them is diminished either by deficiency of blood or its own oxygen contents. The least oxidated layers are those most affected.

Putrefying and decaying sausages commonly undergo the fatty change, beginning in the center of the sausage farthest removed from access of air and oxygen. In adipocere formation from decaying flesh, fat is formed at the expense of albumin, as observed after bodies have been exhumed from the grave. In certain cheeses is observed fatty formation at the expense of the casein, due to the prolongation of the ripening process. All putrid cheeses possess an increased fat content as a product of the putrefactive change.

It is of interest to mention the analogy observed in the putrefaction of wood. Woody fiber when saturated with water and kept from the air, undergoes a softening, loss of texture and disintegration, though generally terminated short of the fatty change. Analysis by Liebig[7] showed that decayed wood always evinced more carbon than did sound wood, and the oxygen and hydrogen present exist in the same proportion as they do in water. Excess of either water or oxygen will arrest the process. Liebig determined that the hydrogen undergoes *combustion* in the above process, as in distinction to the oxidation process, in which *carbon* suffers oxygen combination. It appears from the above that bacteria enhancing putrefaction, probably exhaust oxygen from their culture media, while conversely fermentation organisms appear to favor *carbon oxidation*, which is not *per se* attended by fatty changes, though its acid products must be recognized as favoring an aftercoming process of acid produced suboxidation.

In the fatty degeneration of flesh the source of the carbon of the fat has long been a subject of conjecture.

Deficiency and absence of oxidases and oxygen supporters, as sodium and other alkalies, also have been observed to favor both the physiological and pathological fat formation. Voit and Bauer[10] have experimentally demonstrated that in fatty degeneration, as produced individually by phosphorus or carbonic oxide, both the intake of oxygen and the output of carbon dioxide, are diminished below normal, and that the process is accompanied by an increased output of urea, thus showing that the process of fatty change includes a coincident destruction of the nitrogenous elements, which are eliminated as urea, while the carbon elements seem to remain and suffer the fatty change. Here again we observe a perversion from the normal process, for with adequate oxidation and in beginning degenerations, even from suboxidations, the cells first part with their car-

bon elements, as is observed with the physiological tissue discharge of glycogen as dextrose. An extreme opposite to these processes is found in diabetes mellitus in which the entire proteid molecule is broken down, and in the deficiency or absence of oxidation, is eliminated as a great excess of both urea and glucose in the urine. Arteaga and Lusk[1] assert that 60 per cent. of the proteid molecule is resolvable into dextrose, hence the source of carbon in fatty degeneration is apparent. I have in the past, in common with many other observers, been misled by the enormous output of urea, into the belief that we have in diabetes a greatly increased *metabolism,* but elimination and metabolism are two different things, and my own researches certainly indicate in no uncertain terms that metabolism is not a unit of observation. Only by recognition and observation of normal and morbid *anabolism* and *katabolism,* as separate entities, are we enabled to intelligently and correctly recognize and draw accurate deductions from estimations of the intakes and outputs of metabolic processes. Thus both active and stagnant katabolism may be attended by an increase in the output of urea; in the first place by the increased oxidation by the carbon elements, as in active exercise, the normal activity of katabolism being parallel with the slightly increased urea output, and in the second place, where the active degeneration of the pronounced katabolic stasis of extreme suboxidation as in advanced diabetes mellitus, in which the cells are broken down so rapidly that both nitrogenous and carbon elements are eliminated together. Then the fatty degeneration comes in as an intermediate stage, in which the degeneration is less rapid, the katabolic stasis is more marked, the output of urea elimination is intermediate between the normal and the diabetic extreme, and the fatty metamorphosis of the 60 per cent. of carbon constituent of the protoplasm is in evidence.

An initial expression of protoplasmic suboxidation is a dissolution, separation and exudation of the collagenous elements of the cells, generally associated with the presence of an unusual amount of water; first observed in mucous and serous membranes and other epithelial tissues, or more rapid processes may be manifested by the gelatiniform or colloid degeneration of the least oxidated cells, during the process of which the vascular system becomes involved in the general accumulation in the system of colloid tissue detritus. In ratio to the relative efficiency of the several blood glands, including the liver, where the oxidation of the blood contents is the highest, the eliminations vary in the proportion of urea and ammonia, and the blood frees itself from the obstructing colloid detritus.

The blood, like the tissues, is seriously disorganized and degenerated, in proportion as it is suboxygenated and suboxidated. In addition to oligocythemia, leucocytoses and general cellular degenerations that are observed, it is important that suboxidation causes the blood to lose its normal powers of coagulation and singularly the coincident degeneration favors the formation of thrombosis and embolism. Reoxygenation promptly restores the coagulability and gradually overcomes the disposition to thrombi formation.

The closest analogy, I know of, to the degeneration of the cardiac muscle as a result of fatigue (sarcolactic acid), caused suboxidation, is that of the hound-chased hare, which after being entirely exhausted by fatigue (*run down*), its flesh immediately enters a fatty putrefaction without even first passing through the stage of *rigor mortis.* Obstruction of the coronary arteries is a potent cause of fatty heart, but suboxidation from muscular overwork and fatigue is a much more prolific cause.

In pronounced anemia, in cases of poverty of hemoglobin and of the entire blood volume, as after bleeding, we have the closest analogy to the suboxygenation of cardiac deficiencies, and their prime physical expressions are identical, namely colloidation and fatty degeneration. These processes vary in proportion to each other, in individual cases, and in different diseases, as governed by the general laws above mentioned.

All pernicious blood diseases which are attended with oligocythemia, and their oxidation degradations, as chlorosis, leucemia, pseudoleucemia, anemias, and especially progressive pernicious anemia, produce gelatiniform and fatty degenerations very similar to those observed in the suboxygenations of cardiac deficiencies. The general relaxed and flaccid condition of the tissues, the limp and languid state of the muscles, the succulence of the cells, the atony of the stomach and the general organoptosis tell of the general tissue gelatinification. The marasmi, edemas and hemorrhagicas indicate, in addition to the above condition, the implication of the vascular walls, the broken integrity of the blood and the dissolution of its constituents. The oligocythemia, the leucocytosis, the increase of urea and the diminished carbonic dioxide outputs, together with the subnormal temperatures show both the cause and effect of the suboxidation. Dilatations of the cardiac muscles occasionally occur unpreceded by hypertrophy, thus showing a skip over the period of nutritive gelatinification to that of textural laxity as manifested in the dilatation. The common occurrence of ulceration, fatty degenerations and the disposition to the formation of malignant growths and to pulmonary tuberculosis, as an ultimate termination, are to say the least, significant.

The irritable weakness of patients of these subkatabolisms, of both oligocythemia and cardiac deficiencies, and of the oxidase incompetencies of sexual evolutions and depressions, simulates common ailments characterized as of nervous origin; also, it may be added that extreme suboxygenations from any of the above-mentioned causes are responsible for muscular tension, spasms or epileptiform convulsions.

The idiopathic anxieties of heart disease are manifestations of this same irritability which assumes the form of spasmodic contractions or

convulsions in extreme conditions, and these conditions being less compatible with life than the relaxed ones, narcotics are administered as a choice of evils, the general basic condition being afterward restored by oxidation.

Colloid detritus does not *all* undergo fatty degeneration. Some of it suffers putrefaction, as also all gradations between putrefaction and the fatty change. Of course, more or less of it finds a partial or complete oxidation in some favorable situation.

Victims of cardiac debilities, in addition to the pronounced degenerations above described, also coincidently develop the milder grades of gelatinization of the whole body, which confers a kind of diathesis, by virtue of which marked degenerations are more rapidly and easily developed in susceptible situations. This condition finds frequent expression in the pulmonary tissues, which become gelatinized or even indurated; serous and mucous exudations cause vicious cycles by further embarrassing respiration, and hence oxygenation. The imperfect integrity of the lung tissues dispose them to permit hemorrhages and cause hemorrhagic infarctions, in events of pulmonary vascular engorgements that otherwise would be insufficient. The entire vascular system, owing to gelatiniform changes, suffers serum exudations, causing anasarca, when the blood tension is anything but high; though it must be admitted that changes in the blood itself are partly responsible for it. Vascular incompetencies in the brain also are thus manifested by apoplexy and by fatty changes.

There is an impression by many that the greater tenderness of the meat of stall-fattened animals is due to the cooking of the fat with the lean. This is not the case, however; the same suboxidation which is responsible for the fattening of the animal is also the cause of the softness and succulence of the lean tissues. The well-known effect on castrated male animals and the greater tenderness of the meat of the ox and the cow than that of the bull, and the greater ease with which they are fattened, accords with the observed relation borne by sexual virility to oxidation in man. The softening of meat due to prolonged keeping is equivalent to that due to suboxidation, both being due to degenerative processes.

It may be added that all tissues suffer a vicious cycle, for the accumulation of the maloxidized products of muscular metabolism add to the obstacles to further oxidation.

The heart muscle itself is a sufferer from subkatabolic degeneration. As a result of its first overwork, the formed *sarcolactic acid* lowers its oxidation, a corresponding slump occurs in the ability to oxidate the muscle, and the later formed acid. As a result of the tissue suboxidation we have first a nutritive hypertrophy (by virtue of which nutrition "phagocytosis" is augmented). Then, with the process of the gelatinization the hypertrophy is maintained or enhanced simply by the katabolic stasis in which normal anabolism maintains the balance, the katabolic oxidation and elimination being almost nil. The next stage, we may picture the fatigue extension of the muscular fiber, in which we may assume the muscular hyperplasia to have suffered a change to a longitudinal prolongation, thus the heart passes from a hypertrophy to a dilation, and with its extension of equilibrium length we observe a curtailment of its functional capacity.

The Author's Method of Treatment.—All these conditions must be remedied or the *Heart Cure* must itself prove a failure and the patient must pay the death penalty.

By the aid of my temporary prolongation of the heart's stimulation I endeavor simultaneously to restore the systemic oxidation, to lighten the load as much as possible of the heart's laborious task, and to rid the system of the autotoxication which incidental putrefactions have caused. The former is accomplished by the free inhalation of an abundance of *nascent* and purified oxygen gas, made fresh several times daily, not far from the bedside. It is administered through a tube from a convenient tank, or the whole atmosphere of a small room is impregnated to a point relieving the patient entirely of undue respiratory effort. If the patient is unable to acquire perfect oxidation from the oxygen alone I make up my mind that as the oxygen is fresh and pure, that the trouble is with the patient's powers of oxygenation or oxidation, and in view of the fact that deficiency of hemoglobin, alkalies and oxidases are almost the sole causes of such failures, I proceed to increase these factors, by administering iron internally, and enemas of 50 to 100 per cent. saturated solution of sodium bicarb., inflating the colon, with the temperature at blood heat. If the condition is very low I often add to this a quantity of hydrogen peroxide, which I vary acording to my judgment; also, in suitable cases, I add sodium chloride C. P., which I also vary according to the demands for additional stimulation. The other method employed is the administration of an active oxidase. I have been giving internally a glycerophosphate, or when the patient's stomach is irritated by the glycerin, and often otherwise, for a change, I give a phosphorated oil, preferably a cod-liver oil (but not with hypophosphites). The recently introduced sterilized tubes of glycerophosphates for hypodermic injection which have become so popular in Europe, bid fair to supplant the *internal* preparations for these purposes.

For the second indication, namely the clearing of the vascular system. I clear the portal system by oft repeated, very small doses of calomel and a saline cathartic. By warmth to the extremities I draw the blood as far as possible from the venous splanchnics and cause a determination of blood to the periphery, by cold water taken internally, between periods of eating and digestion. But the restoration of *oxidation* is by far the best remedy for the clearing of the circulation, the relief of resistance to arterial flow and the consequent relief to the heart.

For the third indication, the reoxygenation of the tissues is unparalleled, but the relief of serious anurias is so imperative to the acomplishment of that end that I must grant what its importance deserves, and here I must relate that in my hands, teaspoonful doses of hydrogen peroxide every three hours have restored the twenty-four hour urine to above 50 ounces in cases where one-twenty-fifth grain doses of nitroglycerin had singularly failed.*

It is of interest here to relate that I have repeatedly, promptly arrested cardiac hemorrhages with immediate inhalations of nascent oxygen gas, and by oxygen inhalations combined with soda *colon* injections I have promptly controlled and entirely reduced marked thoracic and abdominal dropsies, in one case within four days, that had previously been tapped twice weekly.

After the patient's improvement, to a point of sitting up a few hours daily, I hasten its continuance by light frictional brushings and massage, and I begin the bath treatment by immersing the feet in a carbonic acid or a capsicum bath, to be followed by the full brine and carbonic acid baths and the resistance exercises. Thus we accomplish the determination of the blood from the splanchnic to the superficial circulation, and from the intestinal vessels to the capillaries of the muscular system. The increased respiration and the reaction from the loss of heat, as do the exercises, greatly accelerate the general oxidation processes of katabolism, and the toning effect incident to it all is the result of the restoration of the muscular tissues which have generally suffered a subkatabolic and hyperplastic extension of the equilibrium length. I have no hesitancy in stating that the real secret of the bath cure lies almost entirely in its physiological effect, as a *cold bath* and that the carbonic acid and alkalies simply counteract the cold by stimulation, and make it possible for a person with cardiac debility to react against and after such a bath, from a temperature which they otherwise could not tolerate. Though carbonic acid is very exhilarating, other stimulants, as capsicum, mustard, ginger, pine needles, etc., are just as good and accomplish the same results. They are superior, in cases where patients do not well tolerate the inhalation of carbonic acid gas given off from the bath, and from which it is difficult to effectually shield the patient.

It is observed that the two principal degenerations of heart disease, namely gelatiniform and fatty metamorphosis, are entirely due to and dependent upon the suboxidation which results from cardiac and blood deficiencies and their vicious cycles, and are preventable, arrestable and restorable in the great majority of cases.

Where colloid degeneration is active, uric acid, as well as other suboxidation tissue products will be excessive, and at such times the portal oxidation of nitrogenous foods may be subnormal, and uric acid may appear from the nuclein elements of meats ingested. In event of such experiences, patients should be warned against Haig's methods of discontinuing red meats, veal, etc., which are of great nutritive value. Bear in mind that if the oxidative processes are ample for tissue katabolism they should be sufficient for proteid food. If both carbohydrates and proteids cannot be eaten, drop the former rather than the latter. Remember they are sometimes incompatible, but often a certain amount of a diffusible alcohol, whisky or brandy, will enhance proteid combustion, while a greater amount, or the same in carbohydrate combination will lessen it.

I have purposely omitted the consideration of the administration of iron, in cases of reduction of the hemoglobin index, for the reason that I assume that its place in medicine is already established. However, I must protest against the indiscriminate use of iron preparations in those other cases of debility, which are assumed without analysis of the blood, to be indications for iron.

Digitalis, while a most valuable drub for cardiac stimulation, is one of the most abused drugs in the pharmacopeia. Its further consideration I will not attempt here.

There are two drugs which, by comparatively recent demonstration, have proven to be very potent in these subkatabolisms, for drawing together and restoring tone in the relaxed tissues, which are administered by hypodermic injection, namely ergot and adrenalin. I have found them both of untold benefit in well-adapted cases, but the last named is a dangerous drug for careless prescribers, and when given by an attendant unskilled in its use, for *in nature* the adjustment of its supply by the adrenal glands is normally very accurate and fine, whereas pernicious results are often obtained by patients themselves or nurses administering it in the physician's absence, by unduly prolonging it beyond attaining the physiological effects, which they fail to recognize.

The proper adaptation of strophanthus, cactus, sparteine, caffeine, strychnine, nitroglycerin, amyl nitrite, quinine, potassium, iodide, etc., I make use of, as they are indicated, and following the rules commonly in vogue as recorded in the textbooks.

For reasons above recorded, arsenic, phosphorus (in excessive doses), lead and other metallic oxides (even mercury, in large doses) dispose to lower oxidation, and are distinctly contraindicated.

Continuous "doping" with liquors is to be discouraged. When uric acid, colloids and other vascular obstructions accumulate in excess, the most highly oxidizable and diffusible forms as whisky or brandy, are indicated, only for a few doses, best given in milk, to clear the portal circulation. However, for this purpose occasionally lemon juice or a citric acid beverage is best. In proportion as the alcohol is combined with carbohydrates, as in beer, porter, ales, stout and sweet wines, or, as wines that are very acid, the tendency to uric acid and colloidal increase is caused.

*I prefer the peroxide of hydrogen possessing the lowest acidity to the volume strength. Acid preparations will increase the anuria.

When not continually given, it is a very valuable stimulant for emergencies.

Both ice water and sulphuric ether, the latter in 10-drop doses, I have found valuable when administered just preceding food, as a help against the expulsion of the food (vomiting) in suitable cases. Rest in bed I compel until the compensation is sufficiently restored to insure freedom from ankle edema, while in the erect position, at least two hours daily.

I often institute full baths before the patient is able to walk to and from the bath, even from one room to another. The exercises I reserve until the compensation is fully restored, and until they can be given without fatigue to the patient. The least manifestation of fatigue or strain is an indication to desist. High blood pressure I reduce by freeing the circulation, as above narrated. Hemorrhages I always treat by the inhalation of oxygen, and internal administration of adrenalin and oil erigeron. The latter acting, I believe, as an additional oxygen carrier.

Intestinal putrefactions, autotoxemia, uremia, bradycardia and Cheyne-Stokes respiration are all indications for local or general increase of oxidation, and are due to toximias of suboxidation.

The rehabilitation of compensatory hypertrophy, I interpret to be a manifestation of enhanced oxidation of the heart, both owing to its reduction of volume, its decrease of equilibrium, length of the muscle fibers, and its consequent increased functional power and capacity.

Many intercurrent diseases and conditions exert marked influences upon the conditions present, which the well-informed physician will recognize and properly treat.

In cases when glycerophosphates are administered by the stomach, physicians must carefully discriminate against all the proprietary preparations containing an abundance of *alcohol* and *sugars,* in combination, which, while very palatable and elegant from the pharmaceutical standpoint, are practically worthless from the medical point of view, owing to the fact that the alcohol and sugar, as burnt in the liver, produce suboxidation in the same way, and quite as much as sweet wines, which will nearly or quite offset the good effects of the glycophosphates, and may cause fatty liver or gout in the bargain.

Users of oxygen which is more than twenty-four hours old, especially that compressed in tanks, will fail to obtain the results I have described. Absolutely pure and nascent oxygen, in my hands, has given the best results. The compounds of oxygen with nitrous oxide gas, *when fresh,* in the proportion of five parts of oxygen to one part of nitrous oxide, are occasionally a benefit in cases of cardiac excitabilities and anxieties.

In those cases where the bile pigments are deficient or absent in the feces and also where the ingested fats are immediately eliminated in the feces, instead of being conducted into the portal system; in both instances causing a superpale yellowness of the stools, I have found the administration of ox-gall and pancreatin with an excess of sodium bicarb., on an empty stomach of great value. In the first instance, the ox-gall supplies the general demands of intestinal digestion, and in the second case, it neutralizes the deficiency of bile in the assimilation of fats and makes possible their assimilation during periods of decline, otherwise impossible. I have found cod-liver oil of greater value than other fats in these cases, owing to its content of biliary elements.

After the patient has been restored to an apparent robust health, before the physician takes his leave, the patient should be given *a lecture,* a warning, as to his shortened limitations, how to maintain his compensation and oxidation, how to live within his limitations, at a happy neutrality between the extremes of overdoing on one hand, and a too sedentary life on the other. He must be taught how to eat, what to eat, what to wear, to avoid a chill, worry, mental, nervous and physical strain and fatigue.

Physicians should never neglect to inquire for specific histories in all heart cases, for, in my experience, they are not uncommon and they are the most difficult and unsatisfactory to treat, and they are the first to backslide and prove unresponsive to the best treatment. Even these cases, however, are well worth treating, and often admit of brilliant successes.

The acute heart failures, which sometimes occur without known cause, should receive a passing mention, for some of their manifestations are not sufficiently described in the text-books, and they are very significant to the expert. The so-called idiopathic anxieties of heart patients must be distinguished from the worries and anxieties of other troubles. A sudden development of nervous unrest, an intense picture of anxiety upon the face, with prominent veins, when associated with dyspnea, cough, distress, palpitation or oppression should receive prompt attention with potent restoratives. In such cases the writer has often responded with ammonia aromat., strychnia, digitalin and morphine simultaneously, the latter three hypodermically, in order to meet the requirement. Idiopathic abdominal pain, another symptom of acute heart failure must be met as above. In these cases, however, gelatinization of the vascular walls has, together with venous engorge ment ultimately overdistended the splanchnic veins, and the pain is the result. The hypodermic administration of ergot or adrenalin, often accomplishes the contraction, and expulsion of the surplus contents of these veins. And in all of these oxygen inhalations, colon irrigations with normal salt solutions and sodium bicarb., hot fomentations to the extremities all help to tide over these cases until other measures can be adopted to meet the more "chronic" indications.

Nothing, other than narcotics, allays pain like bland alkalies, when brought in contact with the seat of the pain, even pain of the most severe burns is allayed and best treated by alkalies, dry, or in oil mixtures.

There are many persons both inside and outside of the medical profession who discourage the *heart cure*. They taboo the idea of treating and prolonging life, in these cases, which so invariably have heart lesions which cannot *per se* be cured. This, however, I believe to be a great mistake, as, for the patients personally considered, I never met one who did not desire his life prolonged, and a restoration, of even ever so limited possibilities for future usefulness. Many men, at a time of life when they have acquired heart disease of serious import are so situated that the family sustenance does not depend upon hard labor, and their advice even, coupled with a long ago obtained knowledge of a business or enterprise, is of great value to his interests, or that of his successors. When independently wealthy, a man's or woman's prolonged life, if comfortable, happy and free from pain, is a great source of happiness to their family and friends. Often mercantile or other business houses will continue to pay large salaries to valuable employes, even if incapacitated for any but light mental work and valued opinions. I have friends in the profession, who, with shortened limitations and artificially sustained compensations, have practised the lighter specialties in medicine for many years, to their own satisfaction, profit and happiness.

Very often a physical breakdown will come to men who are entirely unprepared for it, and their death at such a time would prove a great calamity to their interests, and to their families. I have had the satisfaction often of restoring and maintaining men under such circumstances, and even tided them over until sons could be taken from school and trained, under the advice of the patient, to successfully conduct large interests. I have a gentleman now under my occasional care, who as custodian of one of the great New York municipal institutions, is on his feet daily, Sundays included, from eight to twelve hours, yet he has a severe heart lesion, and has been rescued from imminent death two or three times since I first assumed his care three years ago. Many persons, rescued by the *heart cure,* live many years, and very useful lives, even to die finally of some disease other than of the heart. Some attain quite a ripe old age, with very good compensation and oxidation, while others, for one reason or another, do not live out one additional year. Altogether, however, it favorably compares with other special lines of practice.

My object in contributing this monograph, is not to set forth any personal accomplishments, or brilliant achievements, but rather to give to the profession, as completely as my space will permit, a plan of treatment, based upon what I believe to be a sound etiology and pathology, which has been successful in my hands and which has convinced me will lower the present cardiac mortality over 50 per cent., when in general utilization by the profession. For further exposition of the physiological effects, I refer the reader to my former article.[12*]

*The bibliography of this monograph on the heart is so full as not to require repetition here.

Notwithstanding my desire to see my methods universally adopted and improved upon by other men, my knowledge of the pitiable ignorance of so many professional men on heart physiology, pathology and therapy, causes me to include a word of caution to such men, not to undertake the treatment of cardiac cases without a thorough foundation of information and experience in this line, not excepting a good knowledge of the modern methods of physical examination and diagnosis.

I have purposely limited my article to a treatment basis, that I feel has elsewhere been neglected or undeveloped, and I have made no effort to compass the *full scope* of the therapeutics, even as I practice it; for that, the reader must be referred to the text-books and special works on the heart, and, if possible obtain hospital experience. Bath-house attendants and nurses should be forbidden by law from attempting the administration of *heart* treatment, except under medical superintendence, for it must be understood that these methods are not necessarily harmless in ignorant and inexperienced hands, and that there is nothing so easy as to injure or kill a heart patient, simply by mistakes that would be almost immaterial in the treatment of many ailments.

It is not the mechanical difficulty of giving a bath, but the knowledge and skill necessary to properly treat a person so vitally afflicted, that should cause this treatment, in all its phases, to be wrenched from unskilled and unprofessional hands.

The superiority and essential requirement of a medical man, in these cases, lies not only in his resourceful general knowledge of heart diseases and its resultant and complicating conditions, but also in his skill in the delicate adjustments, which are so necessary to success. Even trained masseurs and other attendants upon caridac patients often require the strictest superintendence by the attending phyician, to insure against awkward, indelicate or careless attentions, thus overexerting the patient, underexerting themselves, or rough handling and careless assistances and administrations.

I have occasionally found it difficult to secure capable persons for the administration of the baths and exercises, even from the ranks of trained masseurs. Even towel rubbings are applied so vigorously and regardless of the patient's tolerance of it as to bring on extreme fatigue, prostration and in consequence acute heart failure, which often requires days or weeks to overcome.

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THE RELATION OF MILD TYPES OF DIPHTHERIA TO THE PUBLIC HEALTH.

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No one who has occasion to examine much that has been written about diphtheria during the last fifty years can fail to be impressed by the noticeable decrease in the volume of the literature of the subject during the half dozen years just passed. It is probably not true that, even with the passing of its terrors, diphtheria has lost much of its interest for physicians, for, although it may no longer be called "the most dreaded disease of childhood," its victims are still numbered by thousands. It is controversy, in medicine, as elsewhere, which drives people to their pens, and recent researches have taken so much that relates to the causation and diagnosis of diphtheria from the arena of the medical journals and placed it among the well-demonstrated facts of medical knowledge that the unending discussions of the last generation find no place in the literature of today. The great importance of the bacteriology of diphtheria has lately overshadowed its clinical aspects, and this, perhaps, by limiting the number of contributors, has lessened the output of medical articles.

It is possible that the future will not provide material for such accounts of great epidemics of diphtheria as help to fill the early transactions of state medical societies and the health reports of England. A study of some of these in the light of our present conceptions of the transmission of disease is wonderfully interesting. Minute descriptions of house-epidemics and school-epidemics, which were intended to prove conclusively the malign influences of ground air and "diphtheria-bearing clays" are invaluable mines from which to obtain confirmation of modern ideas as to the spread of this disease. And yet one is continually struck by the shrewdness of the opinions advanced by some of the earlier writers, and by the closeness with which deductions reached purely by the exercise of logic correspond with the results of the laboratory work of the last fifteen years.

It is hardly possible to state where the earliest record can be found of the fact that *during epidemics of diphtheria, there is usually an increase in the prevalence of simple sore throats,* but the literature to the present time is filled with its repetition. A report of an epidemic in Delaware County, which was presented at a meeting of the New York State Medical Society in 1861 contains the following:[1] "Every reddened throat was not diphtheria, while a very few throats in a circle around the focus, whose diameter was a mile or more, whether young or old, *failed to exhibit more or less traces of the prevailing epidemic influence.*"

Dr. Franklin Parsons, in a report on an outbreak which occurred in 1887 in the parishes of St. Stephen's and Roche, England, says:[2] "As regards the means by which the disease was spread, I am of opinion that, in most instances, its occurrence may be accounted for by infection from a previous case, more especially if we may allow that the known cases of diphtheria were accompanied by a number of mild, unrecognized ones. I learned from more than one source that sore throats were very prevalent in Roche last autumn. Thus the schoolmaster at the Roche Board School states that at the time diphtheria was prevalent, and to a less degree before and afterward, many of the school children had sore throats and used to come to school with their necks tied up in flannel. Experience gained elsewhere has shown that outbreaks of diphtheria are frequently accompanied by a similar prevalence of sore throats not distinctly diphtheritic in character, and has shown it to be probable that, though such cases may not, from a clinical point of view, come within the definition of diphtheria they are essentially of the same nature, and that a susceptible person coming in contact with one of them may contract the disease from it in a severe form."

Physicians and nurses are particularly likely to have such sore throats. A friend of mine tells me that more than once while he has been in close attendance upon cases of diphtheria he has had a violent pharyngitis which did not yield readily to ordinary treatment, although frequent examinations of the throat failed to reveal pseudomembrane.

It is needless to multiply such references, for most physicians who have had outbreaks of diphtheria in their practices can recall instances where mothers and nurses of sick children have been affected with this form of sore throat, and, indeed, the matter has received sufficient notice in most of the text-books.

It is with the diagnosis and management of such cases that we are especially concerned with reference to the public health. It is most essential that their existence should receive official recognition and that they should be assigned a definite place among the varieties of diphtheria.

As Dr. H. W. Hill has pointed out,[3] a number of different conditions may follow the infection of an individual with the bacillus of diphtheria. The disease which we all recognize as diphtheria, with the presence of pseudomembrane and the evidences of systemic poisoning, results from the infection of a susceptible person with virulent diphtheria bacilli. When insusceptible persons become infected with virulent diphtheria bacilli no lesions result, but, as is well known, the bacilli may be transmitted to susceptible persons

and cause the disease. That such infected well persons are a common and potent cause of the spread of diphtheria has been abundantly shown by recent investigations.[4]

Susceptible persons may become infected with diphtheria bacilli wholly lacking in virulence. No lesions follow this occurrence, and the spread of the disease is not aided by such persons, for it has been shown that non-virulent bacilli do not regain virulence readily, if at all.

In this paper it is with two other combinations of the diphtheria bacillus and the individual that we have to deal. Relatively insusceptible persons may become infected with virulent diphtheria bacilli and susceptible persons may become infected with feebly virulent bacilli. In both of these instances the resulting condition is the simple sore throat so prevalent during epidemics of diphtheria. Perhaps the greater number of these cases arise from the insusceptibility of the individual, and this insusceptibility in the vast majority of instances, is due to the immunity conferred by age.

The nomenclature of the various conditions just referred to is a matter of some importance. Several names have been suggested for the simple pharyngitis due to infection with diphtheria bacilli. "Catarrhal diphtheria," "bacteriological diphtheria" and "diphtheritic sore throat" are some of them. It is very important that the name selected should not permit the condition to be confused with that very different one, pseudodiphtheria, the essential feature of which is the presence of a membrane resembling that of diphtheria but due to other organisms than the Klebs-Loeffler bacillus. "Diphtheroid" would be an appropriate name for the condition, for it is *like* diphtheria in the most important feature—the presence of diphtheria bacilli—and the name might suggest to the public the somewhat analogous "variola" and "varioloid," but unfortunately the name diphtheroid has already become associated with pseudodiphtheria. Perhaps catarrhal diphtheria is as good a name as any of those which have been already suggested.

The diagnosis of catarrhal diphtheria (to continue to use that name for the present) *depends entirely upon bacteriological examinations.* However suspicious the circumstances surrounding the case may be, or however direct the history of exposure, it is obvious that a diagnosis cannot be made with certainty without taking cultures. In cities where bacteriological laboratories are maintained by the Boards of Health this is no particular disadvantage, but in places where such facilities are lacking the diagnosis of catarrhal diphtheria must be an exceedingly rare one. When an outbreak of diphtheria is in progress, in even a remote village, with an unusual prevalence of sore throats and especially when these seem to be responsible for the continuance ot the epidemic, it may become necessary for the local health authorities to have cultures taken, and it is interesting to know that in New York State there is no place more than 100 miles from a laboratory where work of this sort could be done. Inoculated culture tubes have been received at the laboratory of the Willard State Hospital after being three days *en route* in both winter and summer and satisfactory growths of diphtheria bacilli obtained from them.

As to the frequency with which cases of catarrhal diphtheria occur there are no adequate means for determining. It has been suggested that the unrecognized cases in an epidemic exceed in number those which are detected. Diphtheria has prevailed at the Willard State Hospital for four years. During that time 158 cases of pharyngeal diphtheria have occurred, four cases involving the larynx, six cases of nasal diphtheria and one in which the vagina, the rectum and the fauces were all involved. From the commencement of the epidemic, every case of sore throat of whatever nature which has occurred among the 2,700 patients and employes residing in the institution has been scrutinized very carefully and a culture taken. There have been found nineteen cases in which redness and swelling of the throat with constitutional disturbance have been accompanied by the presence of diphtheria bacilli. These cases presented absolutely nothing by which the diagnosis could have been made without the aid of cultures. The persistence of the bacilli and the consequent duration of quarantine did not differ from that in cases of "true" diphtheria. As nearly all the people exposed were adults, it might have been expected that the number of catarrhal cases would have exceeded 7 per cent. of all. A few cases among the inmates undoubtedly have escaped notice.

The management of these cases of catarrhal diphtheria is the *crux* of the whole matter. It will be conceded by every one that the first essential is that physicians admit that diphtheria bacilli may be the cause of an inflammation of the throat in which no pseudomembrane is formed and that such cases are quite as capable of causing others as cases of "true" fibrinous diphtheria. It is useless to call them "diphtheria" without a qualifying adjective for the laity from whom, we must not forget, all our quarantine laws have their origin, cannot easily be persuaded that the disease which strangles the little child and the one that causes a transient swelling of the mother's pharynx and tonsils differ only in degree, but if the term "catarrhal diphtheria" (or a better one) be given as definite a clinical application as "varioloid" there is hope that it would speedily find a place in our sanitary laws. Like persons with the ambulatory form of other diseases, those suffering from mild forms of diphtheria are a source of much more danger than those "safe" in bed.

With the facts just stated in mind there can be little difference of opinion as to the measures which will best serve the public health in dealing with cases of catarrhal diphtheria. The condition should be included, under its own name, in the list of notifiable diseases. The same sanitary regulations which relate to the management of diphtheria should be extended to it and, as its recognition depends wholly upon bacteriological ex-

aminations, it is evidently a public duty to provide facilities for this work. That the spread of diphtheria and the continuance of many prolonged epidemics depend, in no small measure, upon these cases of mild diphtheria in adults is a fact which cannot be ignored.

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CHRONIC VILLOUS ARTHRITIS, WITH SPECIAL REFERENCE TO ITS ETIOLOGY AND PATHOLOGY.

BY CHARLES F. PAINTER, M.D.,

AND

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OF BOSTON.

(Continued from Page 920.)

Case No. 23.—October 31, 1902. R., male, twenty-six years of age; a teacher by occupation. Diagnosis, loose cartilage (semilunar). The exciting cause of his illness is trauma. The onset occurred in October, 1902, due to an injury in a football scrimmage. It was accompanied by pain, swelling, limitation, locking, and partial loss of function. No treatment for three weeks, then fixation in plaster. The right knee-joint was involved. It was slightly swollen, had the normal amount of motion in flexion, and could not be completely extended. Palpation was negative. Tenderness over int. condyle. A lateral internal incision was made and the capsule was found to be normal with a slight excess of fluid. Partially detached semilunar cartilage removed. There was one fringe which was attached to the inner ligamentum alæ. The fringe was irregular in shape, of a reddish-purple color, and a soft consistency. No hemorrhage, and irrigation and ligatures were not used. The capsule was closed with silk, with no drainage. Plaster splint applied. The stitches were taken out in one week, and manipulation was tried at the same time. The treatment consisted of flannel bandages and daily manipulations. On January 6, 1903, the amount of motion was normal, there was no swelling or pain, and the functional result was perfect.

Pathology.—Specimen consists of two hypertrophied synovial fringes from behind the patellar tendon, vascular, and of a fatty consistency, 1- 1.5 cm. in diameter. Also thin narrow strip of cartilage which had become almost entirely detached and blocked to some extent the normal joint function of right knee. Microscopical. Periphery of section deeply infiltrated with round cells and very vascular. The central portion consists of adipose tissue with thin feebly staining strands of connective tissue scattered throughout, and the vessels are fewer and of large size for the most part.

For Case 24 see *Boston Medical and Surgical Journal*, March 19, 1903.

Case No. 25.—December 28, 1902. A. D., male, twenty-eight years of age. Diagnosis, trauma. The patient's family and past history are negative. His present illness dates back to an injury to the knee eighteen years ago, caused by trauma to knee due to a fall. The joint is painful in walking and is swollen. Some flexion is possible and the function is impaired. Arthrotomy was performed at the Carney three years ago. Recurrence followed two or three slight injuries. The right knee was involved and swollen, suggesting rheumatoid. Motion quite free. A considerable fringe formation could be palpated and there was no tenderness. A lateral incision over the inside of the joint was made. No fluid or fibrin was found, but several small fringes and considerable thickening and some adhesions. In the treatment no ligatures or irrigation were used. The capsule was closed with silk, was not drained, and a plaster dressing applied. The stitches were taken out in one week. In February, 1903, flexion amounted to a right angle with no swelling or pain and a good functional result.

Pathology.—Fringes from internal and external portions of knee-joint, bound down for the most part and not easily separated. They entirely blocked the joint space. They were removed in small pieces, and had a fibrous quality. On the outside of the joint was an accumulation of tissue of necrotic appearance, resembling a cyst, which contained a small amount of fluid from which no cultural growth was obtained. Microscopical. Feebly staining fibrous tissue in one portion of the section, which did not contain the cortical portion of the mass of tissue in its entirety. This tissue becomes more and more infiltrated with adipose tissue on going inward, until adipose tissue cells of larger size, and an irregular network of slender, twisting, feebly staining fibers fills the field. There are numerous vessels, their walls much hypertrophied, and their lumina often obliterated, while the nuclei of their sheaths stain brightly.

Case No. 26.—December 31, 1902. L. A. G., female, thirty-two years of age. Diagnosis, loose cartilage. Her family and past history are negative. The exciting cause of her present illness was a fall on the left knee four years ago, in 1898. The patient fell, striking her knee on the sidewalk, causing pain, and a slight swelling below the patella. Motion is limited to 50° of flexion, guarded. There is no locking, and a partial loss of function. At the time the patient was laid up for five weeks, and in 1899, and again in 1900, the knee-joint gave out. This last time the knee was operated upon and a fringe removed. In January, 1901, the soreness returned.

The patient was a soft, flabby woman. Her left knee-joint was involved, slightly swollen in appearance, with 50° of flexion, palpation negative, and tenderness over attachment of semilunar cartilage. A lateral incision was made on the inside of the knee-joint, showing no fluid or

fibrin, but a good-sized lipoma and a detached internal semilunar cartilage. The fringe was vascular, yellow, and of a soft consistency. There was no hemorrhage. No ligatures or irrigation. Silk was used to close the capsule. It was not drained and a plaster dressing was applied. On May 8 the amount of motion was more than a right angle, with practically no swelling, no pain, and the patient used the leg freely.

Pathology.—Specimen consists of dark, firm, cartilaginous appearing mass, 2 cm. in length, and a mass of soft tissue, 2x2 cm., from interior of knee-joint. The latter is reddish in color, slightly lobulated, fatty consistency, resembling a degenerated fringe. Microscopical. Specimen consists of a mass of pure adipose tissue, save for a few thin striæ of connective tissue and two irregular solid masses of this tissue with few feebly staining nuclei and the appearance of advanced necrosis of granular and hyaline type. On this latter tissue are a few cells which apparently represent the remains of atrophied vessels. Throughout the section no patent vessels.

For Case 27 see *Boston Medical and Surgical Journal*, March 19, 1903.

Case No. 28.—February 10, 1903. M. C., female, thirty-two years of age. Diagnosis, trauma. Her family and past history are negative. Patient has a neurotic temperament. Her present illness is attributed to an injury to her knee from the horn of a cow fourteen years ago. The acute onset occurred one year ago, without preceding cause, with occasional trouble since. Patient has pain at times, moderate swelling, complete extension being impossible, with locking at intervals occurring in position of flexion, on which occasions patient has limped for several hours. Function is otherwise good, but there has been no improvement. The outside of the left knee-joint is involved. There is a slight swelling below the patella, and the left knee is 1 cm. larger than the right. No redness and motion to within 10° of complete extension. The swelling is soft and boggy on palpation and there is a small area of tenderness over the swollen portion. On February 13 an incision was made on the outer and inner aspect of the left knee. The capsule was not thickened and no fluid or fibrin appeared. One large fatty mass of fringes filled the entire lower portion of the joint cavity, loosely attached throughout to the synovia in shape an irregular lobulated mass 5 cm. in greatest dimension, with an abundant blood supply. The mass was of a yellowish-red in color and soft and yielding. The growth was dissected off the synovia. Considerable hemorrhage occurred but ligatures were not used. Hot water irrigation was tried and the capsule closed with silk. No drainage and a plaster dressing was applied. The general postoperative condition was good, and the stitches were taken out in eight days. The patient was at once manipulated and bandages and applications were used. Swelling, pain and redness appeared and persisted. On March 5 an incision was made over the outer aspect through the capsule, and 150 cc. of clear, straw-colored fluid evacuated. Healing took five days, after which there was a disappearance of symptoms and motion of the knee was rapidly regained. In May, 1903, the amount of motion was complete with no swelling or pain, and a perfect functional result.

Pathology.—Specimen consists of an irregular mass of tissue, 5 cm. in diameter and 1.6 in thickness, from lower portion of knee-joint, behind and to either side of patellar tendon. Growth was attached by numerous adhesions to synovia, not by a single pedicle. Very vascular, red to gray and yellowish in color, the tissue of a half fatty, half fibrous consistency, roughly lobulated, with several large tabs of yellow fatty tissue. Microscopical. A thick cortex of connective tissue, bordered by a single layer of endothelial cells, and marked round-celled infiltration of the outer portions. Thick-walled vessels very numerous. Going away from the periphery the connective tissue gradually gives place to adipose tissue, and persists only in irregular striated formation, while the very numerous vessels have extremely thickened walls and are often entirely obliterated.

Case No. 29. February 20, 1903. W. G. M., female, thirty-seven years of age. Diagnosis, rheumatoid arthritis. Family and past history of the patient are good. Rapid pregnancies (married at eighteen), and much care and worry were the exciting cause of her present illness. The onset occurred five years ago with pain and swelling, but no limitation or locking. Loss of function has been gradual, and there has been a gradual extension to other joints. Treatment has been general, medicinal principally, with hydrotherapy and diet. The knees, elbows, wrists, feet and shoulders are involved. Spindle-shaped swelling. Motion of knees was limited about one-third. On palpation soft, semifluctuant, and with slight tenderness on pressure. A lateral incision was made in both knees, and the capsule was found to be thickened and congested, with no excess of fluid and considerable fibrin. The fringes were numerous, generally attached to the synovial membrane, arborescent and small in shape, vascular, purple in color, and soft. Ligatures were not used, and the joint was irrigated with hot salt solution. Capsule was closed with silk. The wound was not drained, and a soft dressing was applied. Diet and general tonics were prescribed. The stitches were taken out in one week and daily manipulation after the first week with hot and cold douches were given. In May, 1903, the amount of motion was good, swelling slight, no pain, and fairly good functional result.

Pathology.—A dozen synovial tabs of varying size, the largest 4 cm. in length, narrow and with fringe-like processes, growing from the synovial membrane of knee-joint. Color varies from grayish white to reddish-white, while several are harder and contain much brownish pigment. Of fatty fibrous consistency and very irregular in shape. Microscopical. Cortex shows a thin lin-

ing of a single layer of endothelial cells. Within is a broad band of fibrous tissue densely infiltrated with small round cells, often arranged in clumps and whorls. This round-celled infiltration extends well into the interior of the section, but is finally replaced by loose connective tissue arranged very irregularly. Still farther from the periphery are numerous aggregations of fat cells, not, however, to the entire exclusion of the connective tissue. Very numerous vessels, whose endarteritic changes are very noticeable.

Case No. 30.—March 3, 1903. H. L. R., female, thirty-five years of age; nurse. Her family and past history are negative. The history of injury is indefinite.

The onset occurred five months previous, with a sensation of fulness and pain in left knee, followed by swelling. The pain, however, was not acute, but the swelling was symmetrical and quite marked. Extension was not quite complete and function was not much impaired. There was no improvement under strapping, and patient was in bed three weeks, after which crutches and bandage were used. Patient was a neurotic, well-nourished woman. The left knee-joint was involved, and had a swollen appearance on either side of the patellar tendon; swelling apparently of synovial membrane. Fifty per cent. of normal motion only permitted. Crutches and strapping having produced no improvement, patient was operated upon on April 18, 1903. An incision was made over the outer and inner aspects of the left knee. Fluid and fibrin were not found in excess, but there was a large fatty mass occupying upper and outer part of supra patellar pocket, with a similar condition on the inner side. There were also three or four small fringes about the patella and beneath the patellar tendon, attached to the synovia and quite freely movable. These were irregular, flat, very vascular, yellow to red in color, and of a soft and yielding consistency. The hemorrhage was slight. No ligatures. Silk was used to close the capsule; no drainage, and soft dressing was used. The stitches were taken out in one week and manipulation was performed during the third week. At the present date, May 13, 1903, function has not yet been restored to more than about one-half normal. The amount of motion is nearly a right angle. There is some swelling and pain on forcible flexion. And as yet the functional result is imperfect.

Pathology.—Three large irregular tabs from 3 to 2 cm. in length, composed of innumerable minute fringe-like processes, with twice that number of smaller synovial tabs, from a single joint. Attachments to synovial membrane by pedicles of various sizes, all very vascular, of varying color, ranging in same specimen from purple-red to gray and yellow, and of a distinctly soft, yielding, fatty consistency. Microscopical. The cortex shows a connective tissue basis, infiltrated especially on the extreme edge with numbers of small round cells, and interspersed with numerous blood-vessels and spaces filled with blood. In places this cortex is regular in outline, but sometimes it forms irregular tab-like projections, in which the infiltration is much more marked. The central portion of the tissue consists of irregular wavy bands of fibrous tissue separating clumps of fat cells, while numerous vessels appear, the smaller with occluded lumina. A thin cortical lining of flat cells with long nuclei is very apparent in this specimen.

Case No. 31.—March 18, 1903. C. H., female, aged sixteen years. Diagnosis, trauma. Her family and past history are negative. Her present illness was caused by a slight fall eight years ago, and a slight swelling occurred shortly after. The pain has always been very slight, but the swelling has persisted. There is no limitation or locking, although the patient is somewhat disabled and has walked lame at times. The trouble has been persistent. Aspiration was tried one year ago and only a small amount of fluid appeared. The left knee-joint was involved and was swollen 2 cm. more than the right. The arc of motion was normal. The swelling was symmetrical on both sides of the knee, fluctuating and with no redness. On either side of the patella there was a slight tenderness. On March 20 an incision was made on the inner and outer aspect of the knee. The capsule was normal, and one ounce of clear fluid was found. The operation revealed innumerable fringes, rarely over one cm. long, studding the entire inner wall of the joint, attached to the synovial membrane. These were delicate, pedunculated, dendritic outgrowths, very vascular, dark red in color and yielding in consistency. Considerable hemorrhage took place, vessels ligated. Hot water irrigation. The capsule was closed with silk; no draining was done, and a plaster dressing was applied. One week after operation stitches were taken out, and on May 4 right angle flexion was obtained by manipulation under gas. Very few adhesions appeared. The case is not yet discharged, because of adhesions in the joint, the result of injury to the joint membrane from scalding. At this date, May 13, about 15° of free voluntary motion, considerable thickening of the soft parts, but apparently good motion can be obtained.

Pathology.—Six irregular masses of tissue, the largest 3 cm. in length, each composed of a network of very delicate tongue- and club-shaped processes, reaching .5 in length, radiating from a pedicle attached to the synovia. Some of the smaller ones are less fine and delicate and tend to coarser lobulations. Reddish-gray in color, soft and yielding in consistency. Microscopical. Specimen consists of an irregular body cut in cross section with innumerable finger-like processes projecting from it, more or less tightly packed. These show traces of the original endothelial lining. Throughout is a small round-cell infiltration of varying degree, especially about what appear to be the remains of blood-vessels. The whole mass consists aside from these elements of a homogeneous mass of necrotic tissue which has undergone hyaline degeneration. No traces of connective or adipose tissue cells.

Case No. 32.—March 19, 1903. E. G., female, thirty years of age; occupation, housework. Diagnosis, acute arthritis. Her family and past history are negative. There is no known cause for her present illness. Her trouble is acute arthritis in the left knee. Eight years ago and four years ago she had attacks and she since has had a similar attack. The present attack dates nine months back. Pain at irregular intervals, often severe, is referred to the patella. It is accompanied by slight swelling, with no limitation or locking, but with grating and grinding of the joint on starting to walk after resting. At such times patient walks with a limp, which soon wears off. There has been no improvement in her condition. The left knee, which is 1 cm. larger than the right, is the joint involved. On the outer aspect of the patellar tendon is a swelling the size of a quarter of a dollar. The arc of motion is normal. The swelling is soft and boggy, with no redness or tenderness. There is one large lipomatous fringe on the outer aspect of the joint attached to the synovia by a broad pedicle. This is irregular and lobulated in shape, very vascular, yellow-red in color, and of a fatty and yielding consistency. Otherwise the joint is normal. The growth was excised. A moderate hemorrhage occurred. No ligatures were used. Hot water irrigation, capsule closed with silk. The wound was not drained and plaster dressing was used. The postoperative condition was excellent and the stitches were taken out after seven days. Manipulation immediately followed with bandaging. In one week 90° of flexion was possible. On May 6 normal flexion and extension with no swelling or pain, and an excellent functional result was procured.

Pathology.—A lobulated, yellowish, fatty growth, 5x3 cm., with a broad attachment to the synovial lining of the knee-joint. The attachment very vascular, and darker in color than the bulk of the tumor mass. Tissue of a gristly nature on palpation. Microscopical. A very thin cortex, often no more than a thin endothelial lining of a single layer of cells, but in places containing fibrous tissue with round-celled infiltration. The bulk of the tissue composed of adipose tissue, and numerous vessels of varying size in cross and longitudinal section, nearly all of them with obliterated lumina.

Case No. 33.—April 16, 1903. C. F., male, fifteen years of age; office boy. Diagnosis, relaxed joints. His family and past history are negative. There is no known cause for his present illness. His general condition at the time was poor. The onset was gradual and began seven months ago. Sharp, not constant, pain beneath the patella, especially when sitting. Patient noticed no swelling, and had no limitation or locking, but a sensation of crackling and slipping in knee. He can walk about. The symptoms have increased and are chiefly in the right knee. Both knees are involved and a slight swelling appears on either side of the patellar tendon. The arc of motion is normal. On palpation a sensation of slipping above and inside right patella. There is no tenderness. On April 8 an incision over the inner aspect of the knee. The capsule was not thickened and there was no fibrin or fluid. Four or five excrescences, the largest 1 cm. in diameter, were attached to the synovial membrane. They had a broad base, tapering to a blunt point, were lobulated, rich in blood, of a red color, and firm and fibrous. These fringes were excised with a slight hemorrhage. A few small vessels were tied with ligatures, and hot water irrigation was used and the capsule was closed with silk without drainage. Plaster dressing was used. The general postoperative condition was excellent and the stitches were taken out in eight days. Immediate manipulation was given and function was restored in one week. In May, 1903, the amount of motion was complete, with no swelling or any pain, and a perfect functional result.

Pathology.—Three small tabs from synovial surface of knee-joint, the largest 2 cm., the smallest 1 cm. in length, attached to membrane by broad base, and tapering outward to a point. Slightly lobulated. Of gray-red color and fatty-fibrous consistency. They projected prominently from surface of membrane. Microscopical. A thick cortex of connective tissue densely infiltrated with small round cells, the enclosing membrane not apparent. Numerous small thick-walled vessels. Within this layer is a layer of normal connective tissue which as it goes inward becomes more and more infiltrated with fat cells. Throughout this inner portion numerous thick-walled vessels running outward toward the periphery and surrounded with varying amounts of connective tissue. Numerous small vessels also present, often with occluded lumina.

Etiology.—Local tissue changes are effected in many different ways. In the condition here being considered, it would seem that the causes might be classified under the heads of (I) traumata, (II) infections, and (III) diathetic conditions.

I. Trauma.—Under the head of traumata are to be considered (1) direct blows and injuries to a joint and (2) indirect injuries, the consequence of strain to the joint from faulty position resulting in impairment of function. Traumata also result from within the joint itself, as when (3) a semilunar cartilage becomes partially detached, causing impairment of the function and, in some cases, direct violence to the synovial membrane (*e.g.*, Nos. 19 and 23). (4) Loose bodies in a joint, the so-called joint "mice," are capable of causing synovial irritation. (5) Forcible wrenches or lacerations of the ligaments of the joints (either the supporting external or the internal), weaken the joint, cause a relaxation of the ligaments, impair the function, and may thus cause the villous hypertrophy. (6) Flat and pronated feet, by causing strain to the internal lateral ligaments of the knee, are common causes of congested or hyperæmic knees, particularly in stout and flabby individuals, usually women. This condition is not uncommonly an accompaniment of the early convalescence from the confinement of pregnancy (*e.g.*, No. 12), and is also occasion-

ally met with at puberty in rapidly growing but sickly children, where there is much muscular and ligamentous loss of tone. We have also observed it in a young woman in whom there was some knock-knee and elongation of the patellar tendon. This was accompanied by considerable relaxation of the capsule of the knee-joint and thickening of that portion of it on either side of this tendon at the level of the line of the joint. Fibrinous clots cause sufficient trauma to irritate the synovia.

II. Infections.—Among infections first of all should be placed (1) tuberculosis. Some tuberculous joints show it more than others. As a rule, those in which the process has shown itself primarily in the soft structures of the joint rather than in the bones illustrate villous hypertrophy most decidedly. Usually, a tuberculous condition can be readily diagnosed clinically, and the aid of the microscope is rarely necessary. The difficulty of the histological diagnosis of these fringes has been demonstrated once in our experience where excision of the knee was performed following a pathological diagnosis of joint tuberculosis. The subsequent history made the diagnosis of joint syphilis much more probable (see Case 2). It has been shown occasionally that tuberculosis has grafted itself upon an ordinary hypertrophied fringe, which has evidently been pre-existent to the tuberculosis. (2) Gonorrhea, and probably other infective processes, cause villous hypertrophy. The writers have seen this in two cases here reported, namely, Nos. 21 and 22. In the more rapidly developing inflammatory conditions there is not as much villous enlargement as in the more chronic processes, probably because the invasion of the synovial membrane with such numbers of round cells prevents the folding up of the membrane, and the vascular changes are not so conspicuous as in the subacute processes heretofore mentioned. (3) Syphilis. The extensive hypertrophy of the synovial membrane due to syphilis has been mistaken both before and after exploration of the joint for rheumatoid arthritis. In one of our cases the correct diagnosis was arrived at when, one and one-half years after the arthrotomy, the tissues of the knee broke down and typical syphilitic ulcerations appeared. These cleared up with great promptness, and the swelling of the knee almost disappeared under large doses of the iodide of potassium (*e.g.*, 2 and 6).

III. Diathetic.—Under this head we have rheumatoid arthritis and osteo-arthritis. By the former we mean that polyarticular joint affection of the young adult which is characterized by spindle-shaped swellings of the joints affected, thickening of the joint capsule, and atrophy of the cartilage and bone. By osteo-arthritis we mean that polyarticular affection, usually of later adult life, characterized by hypertrophy and lipping of bone and cartilage, causing what is known as Heberden's nodes when the terminal phalanges are involved, and morbus coxæ sensilis when the hip is involved. Both of these diseases are accompanied by great villous hypertrophy of the synovial membrane, rheumatoid being much the more common.

In several of the cases here reported this was the etiological factor, namely, Nos. 5, 8, 9, and 29. That osteo-arthritic joint involvement, due at times to a general diathetic condition, but often wholly or in part to local trauma, may be a direct cause of villous hypertrophy, is illustrated by Case No. 7. The patient had a bony spur, evidently the direct result of an injury in football. This spur was surrounded by a villous hypertrophy. Removal of the spur and fringes certainly produced a complete cure twelve years after the original injury.

Clinical History.—The joints most frequently affected with these forms of arthritis are the knee, the shoulder, the ankle, and the hip. Of these the knee is most frequently involved, probably on account of its exposed position, its function in the weight-bearing of the body, and the nature of its internal anatomy. Its exposed situation makes it liable to external trauma. Its function in the weight-bearing makes it liable to strain, and its internal mechanism is of a nature to be easily deranged. To a less degree these reasons apply to the other joints which have been mentioned. Depending upon the etiology of the arthritis in question, we find the type to be either monarticular or polyarticular. In cases following trauma, either direct or indirect, the lesion is monarticular, except where the etiological factor is bilateral in its distribution, such as pronation of the feet, relaxed knee-joint ligaments, etc.

Of course, where the hypertrophy of villi is due to toxic or inflammatory agents circulating in the blood, or to metabolic disturbances, affecting the general processes of the body, one would expect to find a polyarthritis, and this is usually the case. In looking over the history of these cases, it is noticeable that a considerable period of time has passed since the beginning of the trouble. This is particularly true of the traumatic cases. In these an interval of years rather than months or weeks is the customary rule. The explanation of this is probably that, until fibrous changes of considerable extent take place in these fringes, they do not simulate foreign bodies as they do subsequent to such fibrous change. In the early stage of passive congestion they are soft, and are readily disposed of in the act of moving the joint, and so do not give rise to symptoms other than swelling and a certain amount of discomfort and inconvenience upon first rising from a sitting position. Where some diathetic cause has been in operation, the fringe development has undoubtedly been so insidious that the patient cannot give a definite date to the onset of the joint symptoms. Here, then, we do not ordinarily find so long an interval between the onset of the trouble and the development of the joint fringes. In many cases there have been long intervals without symptoms referable to the joint. Such is usually the history where the primary cause was a trauma, giving rise to symptoms which were more or less temporary, with subsequent secondary traumata and lighting up of fresh symptoms. The symptomatology of this form of arthritis is often very indefinite, and

readily accounts for the lack of attention hitherto paid to the condition. There is sometimes an immediate onset of symptoms directly associated with the trauma, but more usually the symptoms which are due to the fringe are distinctly different in the mind of the patient from those which resulted from the trauma itself. The symptoms which are directly referable then to the presence of the fringe are these: a more or less frequently recurring synovitis which perhaps never wholly disappears, a sensation of pinching something between the component bones of the joint in the act of walking, at first occurring rarely, but becoming progressively a more or less constant symptom during the use of the joint. There is also a more or less local swelling of the membrane of the joint, usually of that portion which is below the patella and on either side of the patellar tendon. Pain is not ordinarily present when the patient is quiet. Sometimes this radiates down the leg almost to the ankle, and is usually of a sharp incisive character. The normal passive motion of the joint is not interfered with in flexion, and only occasionally is extension somewhat limited. When this occurs, it is usually due to the hypertrophy of those few villi which arise from the alar ligaments. Locking of the joint almost never occurs, as it does in the case of the dislocated cartilages. Although the patient is conscious of the presence of a soft body between the articular surfaces, he is usually able to flex or extend the joint at will. What has just been said regarding the symptomatology applies principally to the traumatic cases. Those which are due to a definite arthritis of toxic or diathetic origin differ in that the swelling is more symmetrical, is rarely or never confined to any one quarter of the joint, is accompanied much less frequently by a true effusion. Where the hypertrophy of the synovial membrane is general, the joint often appears to be filled with fluid. The patella seems to float, fluctuation is easily obtainable, and one is frequently surprised on opening the joint to find no excess of fluid. Under these circumstances one finds a very large mass of soft friable fringes, which protrude from the joint as soon as the capsule is opened. They look and feel in many cases like masses of small angle worms. In the cases dependent upon a general diathesis, as rheumatoid arthritis, contracture of the joints, spasm of the muscles, and other evidences of a true arthritis are usually found. Such symptoms do not commonly accompany the villous hypertrophy due to trauma. Measurements made will show an increase in the size of the affected joints which, in cases of traumatic origin, is usually either below the patella or above the patella only. In the other types the swelling is more diffuse, and the enlargement of the joint is noticeable throughout its entire extent. Pain on motion of the joint is not commonly noted, except in the cases where there is a definite arthritis of diathetic origin. Tenderness, localized over the fringes which are most readily palpable, is not uncommon, and is, in fact, usually present where the fringe is of any considerable size.

Differential Diagnosis.—In diagnosing this condition from others, few affections are to be considered. It cannot always be determined which of the several possible causes is responsible for the trouble. Usually, in the presence of any obvious joint disease, the explanation of existing fringes is not far to seek. Defects in the standing position of patients productive of joint strain at the knee should be looked for to explain symptoms such as have just been enumerated. The history of trauma should be inquired into. It has usually been sufficiently severe to attract attention. The general conditions occurring in weak and debilitated people which cause general and local muscular relaxation must also be borne in mind.

With these general observations it remains to consider what other conditions may cause these symptoms. Early synovial tuberculosis must be borne in mind. The patient's general condition in these cases is usually poor, as is also the case in rheumatoid arthritis. Tuberculosis, however, is monarticular, while rheumatoid arthritis is polyarticular in a large majority of cases. It is in these early tubercular cases that explorations are indicated after other methods of diagnosis have been exhausted.

The history of a gonorrheal affection accompanied by definite joint involvements is suggestive, but a simple history of a gonorrhœa at some more or less remote period is of no significance. It also should be borne in mind that the infective arthritic processes are possible excitants to rheumatoid changes, and that such a history, with rheumatoid appearances in the joints on gross examination, may indicate the subacute or chronic state of an infective process, or the early stage of a rheumatoid. A histological examination would probably clear up such a diagnosis.

A dislocated or partially dislocated semilunar cartilage may cause confusion, and it is sometimes impossible to establish the diagnosis. As a rule, there is not the locking of the joint in a partially extended position in the villous hypertrophy, as there so frequently is in the case of the cartilage; and the history of the dislocated cartilage is suggestive.

The difficulty arises where the cartilage was but slightly displaced, and was not accompanied by the customary trauma. In three cases in this series there were found hypertrophied synovial fringes, evidently due to the derangement of the joint in consequence of a partially detached cartilage which had not been definitely diagnosed (Nos. 15 and 26). An habitually recurring synovitis will frequently be found to be due to the existence of a fringe or fringes. Any simple synovitis that cannot be explained away on some reasonable ground should cause suspicion. In this series is one case of intermittent hydrops that was full of well-developed fringes. The hydrops was not materially benefited for any considerable length of time by the removal of the greater part of the fringes, so that this condition was probably simply a coincidence in the process. Intermittency in the accumulation of a synovitis would

lead one to be rather less sanguine as to the probable benefit of an arthrotomy in a villous arthritis thus complicated, and should be borne in mind in the differential diagnosis. The cases in which malignant disease, as sarcoma, finds its starting point in the villi of a joint are so rare that they must be regarded in the light of medical curiosities. Of monarticular affections osteo-arthritis not commonly causes a villous arthritis. This is usually accomplished by the trauma inflicted upon the joint by the osteo-arthritic spurs, which develop about the condyles and along the border of the patella. These irritate the synovial membrane, and cause the development of fringes in their neighborhood. These spurs can usually be recognized on palpation and almost always in the skiagram.

Treatment.—The treatment varies with the causation of the arthritis. Very many of the early cases, when caused by pronated or flat feet, where the condition in the knee-joint is that of a passive hyperemia due to the malposition, are promptly and permanently cured by resort to a proper support for the foot. This must be worn for a considerable time after the subsidence of the joint symptoms. Adhesive plaster strapping tightly applied over the front and sides of the knee to compress the synovial membrane and lessen the chance of its being crowded together and pinched by the action of the joint is helpful in relieving the symptoms and causing the fringes in some cases to shrink up. This is particularly true in the cases where the condition results from general loss of tone in the joint capsule or from faulty attitudes in standing and walking.

Where the villous hypertrophy is due to some diathesis, such treatment can be only palliative. In this last class of cases, however, the presence of the fringes is a source of irritation and injury to the joint, and here, as in all other cases, where strapping, bandaging, and correction of existing causative defects in the feet are not effective, operative measures should be taken. Prolonged fixation in plaster or other splints does not accomplish any permanent good, and long-continued conservative treatment is not to be recommended. The fact that the individual and not simply the joint is being treated should not be lost sight of, and general tonic treatment, massage, and exercises are indicated in the appropriate cases. In the osteo-arthritic cases, of course, any stirring up of the joints where spur formation is causing the villous hypertrophy is to be avoided. This applies to massage as well as to exercise, and here partial fixation in removable splints of leather is at times effective in quieting down the process. In such conditions as muscular and ligamentous laxity, some stages of the rheumatoid process, and the later or convalescent condition of the primarily infective cases, massage, exercise, and such measures are effective, and should be used. Here, also, local stimulating treatment by means of the alternate douche of hot and cold water is very beneficial. In the more acute stages of the rheumatoid fringes, hot fomentations and rubber dam worn next the skin at night give the patient more comfort, although the nature of their therapeutic value is uncertain. Dry heat at high temperatures is of little value.

The therapeutic treatment of the underlying condition in those cases, caused by rheumatoid and osteo-arthritis, is most unsatisfactory. The acute rheumatic remedies should be used very sparingly, and never continuously. The same is true of the sedatives and soporifics. Careful nursing, fixation of the affected joints during the acute stage, and general tonic treatment give the best results in the long run. Diet should be plain, but plentiful, and restricted only by the patient's capacity for digestion. These details are gone into here for two reasons. Many practitioners who have overlooked the fringes, because they have not examined their patient's joints, regard the symptoms arising from these conditions as rheumatic, and treat them accordingly The result is that the patient's general health becomes undermined, and if, perchance, the villous arthritis is rheumatoid in character, the worst consequences are to be expected. On the other hand, rational therapeutics has its place, and should be thoroughly followed.

Operative Treatment.—Failing in the relief of these conditions by the before-mentioned conservative measures, we have to consider the radical or operative procedures. These are to be undertaken when other treatment has been tried and failed, or when the condition is such as obviously could not be relieved by conservative methods. It offers the quickest and, in the long run, the most satisfactory results. It is not attended by any particular risk, and is rational in every way, especially in the cases of traumatic origin. Under the modern technique one thinks very little of the risks of infection. In this series of cases this has not occurred. With proper after-treatment there is no serious probability of a stiff joint, and restoration to normal motion and complete function is usually speedy and uncomplicated. There is practically no risk of weakening the joint because of the incision through its fibrous envelope, and there have been, so far as observed, no late sequelæ which tend to make one hesitate to operate. Where the villous arthritis is simply an evidence of a chronic general disease, the purpose of the operation differs from that in the cases in which the hypertrophied villi are the result of an injury or of some acute inflammatory process. To reach these fringes in the knee-joint, which is the joint most commonly explored, it has been found that a lateral incision about 5 to 6 cm. long over the inner aspect of the joint, extending a short distance below its lower border, affords an opportunity to investigate a considerable portion of the synovial membrane by direct inspection, and what cannot be seen can be explored by the finger. Familiarity with the "feel" of the fringes makes one quite expert in detecting them where they cannot be seen. If in this way it is demonstrable, or presumable even, that more fringes are situated on the outer side of the joint, a similar in-

cision is to be recommended over that aspect. In extreme cases, usually due to some diathesis, where there is extensive hypertrophy of the villi, we think that it is reasonable and proper to connect the two incisions which are usually made for exploratory purposes at their lower extremities, and in doing this to divide the patellar tendon close to its insertion into the lower border of the patella. On turning back the flap, the entire joint cavity is exposed, and the dissection of the villi is much more easily accomplished. The objection to this procedure is that the convalescence is necessarily prolonged because of the six weeks or more of immobilization of the knee required after division and suture of the patellar tendon. In several cases where joint tuberculosis has been diagnosed early excision of the parts of the synovial membrane attacked by the disease has been attempted, and this incision has given admirable opportunity for the removal of the disease, while the functional results have been extremely good. This, too, in spite of the fact that it was necessary, because of the nature of the disease, to protract the convalescent treatment very materially.

The removal of these villi is not ordinarily accompanied by any recurrence because the cicatrization of the denuded portion of the capsular surface causes the entire membrane to shrink, and scar tissue does not readily lend itself to villous hypertrophy. Thus, even in the diathetic cases, where the removal of the fringes is performed for the sake of freeing the joint from their irritative action, good results may be expected both locally and generally, through the improved function of the joint and the consequent influence which this improved function has upon the general condition of the patient.

Sometimes, on account of the vascularity of these fringes, some difficulty is experienced in checking the hemorrhage. It is impossible to ligate all the small bleeding vessels inside the joint, and the cauterizing effect of hot water is necessary. The only bad result attributable to our technic which has occurred in this series of cases was one in which the water supplied was so hot that the synovial membrane was scalded, and sloughing took place. This case is still under treatment, and we are trying to secure motion in the joint with apparently satisfactory results.

The capsule is closed with interrupted silk sutures, usually four or five in number, placed some distance apart, so as not to close too completely the synovial capsule. They also include the fibrous tissue. The skin incision is closed with either interrupted silkworm gut or subcutaneous continuous silver. In the majority of cases silkworm gut was used. In regard to dressings we have had experience both with fixation and with soft dressings alone. All our early cases were put up first in plaster-of-Paris dressings, which were kept on for at least a week.

In several recent cases immobilization was not practised, a soft dressing only being used. Joint effusion was not more marked.

(To be Continued.)

ECLAMPSIA HEMORRHAGICA. REPORT OF A CASE.

BY RALPH WALDO LOBENSTINE, M.D.,

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A REPORT of this case may prove of some interest (1) Because of the uncertain etiology of the disease; (2) because of its severity; and (3) because of the rarity of this type of eclampsia (three cases only in the last 128 cases of eclampsia in this hospital).

Inasmuch as the etiological differences between eclampsia and nephritis with uremia remain still unsettled, it is as yet impossible to say whether or not the hemorrhages that occur in the two diseases are due to the same factors.

With reference to the essential pathological lesions of eclampsia, we know that there are to be found in the various organs of the body small areas of necrosis, due to thrombi in many of the smaller blood-vessels; but we do not know the true nature of the substance which, circulating in the blood, gives rise to these thrombi. The organs chiefly affected are the liver, kidneys and brain; of these, the liver seems to be the most constantly affected. In eclampsia hemorrhagica, likewise, the liver appears to be more often involved than any one other organ, as jaundice is to be found in the great bulk of the cases. The jaundice often manifesting itself before the appearance of the first hemorrhage. On autopsy, the liver presents to a marked degree, the appearance of acute yellow atrophy. This type is considered to be due to a greater toxicity of the blood, than the former, the hemorrhages indicating a greater impairment of the walls of the capillaries.

History.—The patient was a primipara, aged twenty-two years, 6½ months pregnant. She gave no previous renal history; her health had always been excellent, up to three days prior to her entering the hospital. During these three days she suffered from headache, scotomata and nausea.

Examination on Admission (September 22, 1902 at 1 P.M.).—(*a*) Subjective symptoms. Headache, scotomata, nausea; (*b*) objective symptoms. The patient appeared but moderately poisoned. There was slight edema of the ankles and feet. The heart and lungs were normal. The pulse was 98, of high tension, full and bounding. The abdomen showed the usual signs of a six to seven months' pregnancy. By vaginal examination, the cervix was found to be soft, fairly elongated, and to admit one finger throughout. The urinalysis report was acid; sp. gr. 1,026; albumin 30 per cent. by vol.; many casts of all varieties.

Course of the Disease.—Antepartum (September 22). Despite medical treatment, the patient had a very severe convulsion, about three hours after admission. Labor was, therefore, at once induced by means of a No. 1 Voorhees bag. This was expelled about two hours later, the patient being, in the meantime, kept under the influence of chloral and nitroglycerin. At 7 P.M. an ac-

couchement forcé was performed by Dr. Edwin B. Cragin. The fetus was non-viable.

Postpartum (September 22). The patient stood the operation well and seemed to improve considerably after the delivery. There was neither headache nor nausea. She slept quietly most of the night. When awake nourishment was well taken. Temperature 99.8° F.; pulse 84 with less tension; respiration 24.

(September 23). Severe frontal headache; moderate nausea and vomiting; restless but no convulsions. Nourishment fairly well taken. Lochia moderate, red; temperature 99° to 97.8° F.; pulse 80 to 100, of moderate tension; respiration 20 to 30; urinalysis, acid; sp. gr., 1.016; albumin, $^{2}/_{10}$ per cent. by weight; urea gr. 3 to ℈i; many hyaline and granular casts; total quantity, 50 ounces.

(September 24). Nauseated; vomited several times *dark brown fluid;* abdomen distended, painful and tender. Tenderness especially marked in the right hypochondrium. Moderate jaundice; edema of the face; *expectorated bright red blood* in the evening, and complained of a severe pharyngitis. Pharynx congested. Temperature, 98.4° F.; pulse, 110 to 120, of high tension; respiration, 20 to 28. Lochia moderate, dark red. Urinalysis, acid, 1.018; albumin, $^{6}/_{10}$ per cent. by weight; urea, gr. 2 to ℈i; moderate number of hyaline, granular and epithelial casts. Total quantity ℥ 24+.

(September 25). Frequent vomiting of *dark brown fluid;* abdomen somewhat less distended and tender; fair result from strong catharsis; jaundice the same: *many petechial spots on trunk and extremities;* pharynx very painful; submucous retropharyngeal hematoma. Some general improvement toward evening: temperature 98° to 100.2° F.; pulse, 130 to 120, irregular at times and of moderate tension; respiration, 36 to 30; lochia moderate, dark red. Urinalysis, acid, 1.026; albumin, $^{5}/_{10}$ per cent. by weight; urea, gr. 8 to ℈i; many hyaline and granular casts; total quantity, 61 ounces+.

(September 26). No headache; less irritable and restless; pharynx the same; *vomited dark brown fluid;* abdomen moderately distended and tender; no enlargement of the liver. Temperature, 100° to 98.4° F.; pulse 128 to 100, of low tension; respiration, 30 to 24; lochia, moderate, dark red; urinalysis, acid, 1.024; albumin, $^{1}/_{10}$ per cent. by weight; urea 7½ gr. to ℈i; casts of all varieties; total quantity, 69 ounces.

(September 27). General condition apparently improved; pharynx improved; no vomiting; *blood-stained fluid defecation.* Temperature, 98.4° to 100.2° F.; pulse, 118 to 114; respiration, 20; lochia, moderate, dark red. Urinalysis, acid, 1.026; albumin, $^{2}/_{10}$ per cent. by weight; urea, gr. 8 to ℈i; fewer casts; pus and epithelial cells; total quantity, 52 ounces.

(September 28). Nauseated, *vomited dark red blood* several times; severe epigastric pain; abdomen tender and somewhat distended; jaundice the same; no headache; restless. Temperature 100.6° to 101° F., pulse, 124 to 112; respiration, 28 to 38; lochia, moderate, dark red; urinalysis; acid, 1.024; albumin, $^{2}/_{10}$ per cent. by weight; urea, gr. 9 to ℈i; casts decreasing; total quantity, 53 ounces.

(September 29). Jaundice less; pharynx no longer painful; hematoma decreased in size; *tarry stools;* general improvement toward evening. Temperature, 100.4° to 100.6° F.; pulse, 120 to 110; respiration, 28. Lochia moderate, dark red. Urinalysis, alkaline, 1.022; albumin, $^{1}/_{10}$ per cent. by weight; urea, gr. 8½ to ℈i; total quantity, 56 ounces; very few casts.

(September 30). No headache; no restlessness; cheerful; no abdominal pain and only slight distention; vomited *small amount of blood;* stools normal. Lochia moderate, dark red, with odor. Temperature 100.8° to 101° F.; pulse, 112 to 118; respiration, 26 to 30; urinalysis, acid, 1.024; albumin, $^{2}/_{10}$ per cent. by weight; urea, gr. 9 to ℈i; total quantity, 25 ounces; only few casts.

(October 1). Marked general improvement; jaundice and petechial spots have almost disappeared; abdomen soft; nourishment well taken. Lochia moderate, yellow, with odor (slight). Temperature, 101° to 99° F.; pulse, 110 to 120; respiration, 28 to 32.

From this time on the patient made an uninterrupted recovery. There were no further hemorrhages. The albumin and casts gradually disappeared. The temperature, which was in part due to some slight uterine absorption, gradually dropped to the normal. The patient was discharged on October 19, in very fair condition.

To Summarize.—We find an eclamptic with but one convulsion, but with hemorrhage into the skin, pharynx, stomach, liver and intestine, accompanied with jaundice.

Brief Outline of the Treatment.—For the convulsive period; sedatives, arterial dilators, accouchement forcé. For the general toxemic condition, hydrotherapy and stimulation; for the hemorrhage, suprarenal extract; during convalescence, tonics.

WHO MAY BENEFIT BY ALTITUDE TREATMENT?*

BY J. N. HALL, M.D.,
OF DENVER, COLO.

My excuse for presenting this rather timeworn subject is that the physicians in the Rocky Mountain region still see a considerable number of patients sent from other localities who might better have remained at home. In my twenty years' experience here, I have noted continually greater care in the selection of cases to be sent here by physicians in the East. I write this with the hope of doing my small share to bring about a further improvement.

It is not only a lack of trained judgment upon the part of a physician which may lead to the

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sending of unsuitable cases to the West. The very great majority of the patients we see have had the benefit of careful examination and discriminating estimate of their condition by excellent practitioners. But a few have been advised, not, to be sure, by men of the character of our own membership, to go to the Rocky Mountains, without the trouble even of stripping the chest for examination. I have seen cases of heart disease, asthma, and chronic bronchitis, sent to me with a diagnosis of tuberculosis. These are the patients who say: "Why, Dr. Blank did not ask me to remove even my coat when he examined me." Such carelessness is criminal.

Certain patients with advanced lung trouble must have been sent with a certain knowledge that they could not live a month. Five days ago I saw such a one who died on his fifth day in Colorado who had not even been told that he had tuberculosis. My statement to his sister that he had but a few days to live came to her like a thunderbolt. She stated that they had always feared that he might contract tuberculosis, but their physician had told them that he had only a slight bronchial trouble.

My own explanation of such a mistake, and it is far too common, is as follows: The patient complains of a cough, and receives a cough mixture without any but the most perfunctory examination of the lungs. As the cough progresses a relative asks if it is possible that the case is one of phthisis. The doctor assures him that "it is only a bronchitis," and "that it will be better when the weather becomes settled." Meanwhile, the patient, who ought to be at rest and upon a suitable diet in a proper location, continues, as did the one just mentioned, to work in an ill-ventilated newspaper office. He finally becomes so ill that a change of diagnosis must be made or the patient sent away. I fear the latter course is occasionally the easier for this type of physician. I have repeatedly known their poor victims to be so ill upon arrival at the station as to preclude the possibility of sending them home alive. Proper examination, honesty and the most ordinary judgment would prevent these errors.

Of the conditions suitable for altitude treatment in this region, pulmonary tuberculosis is the most important, as all must recognize. The percentage of recovery depends more upon one factor than upon all others combined, namely, the stage of the disease. A large percentage of physicians recover from tuberculosis here. It is accounted for solely by the fact that the doctor with a beginning cough falls early into expert hands, and is sent away with the first suspicion of the true nature of his disease. If all patients with cough were sent to the mountains upon the appearance of a few crackles in one apex, without waiting for dulness to appear, and even before a positively bacillary examination was obtained, there would be more well men and fewer diagnoses of consumption. I know a score of physicians in robust health who have started West upon a week's notice and recovered. Had they waited the advent of well-marked dulness, I should have known fewer of them. The urgent need in the treatment of tuberculosis of the lungs is not, in our present age, cod liver oil, not creosote, nor yet a curative serum, but early diagnosis. Given this, without even waiting for too absolute proof of its correctness, if the first bacteriological examination be not positive, and we may expect 90 per cent. of recoveries. As infiltration is added to the catarrhal process the diagnosis is easier and surer, but the prognosis is proportionally less favorable. After considerable dulness and even excavation occur at one apex, there is a fighting chance of arrest, and a good chance of delayed progress. Involvement of both lungs, except it be purely catarrhal, generally precludes hope of complete arrest.

The predominance of the fibroid element in the tuberculous process is certainly favorable as to slowness of advance, but cases with this characteristic rarely attain the complete arrest so often seen in the early catarrhal cases. I see many of these cases following pleurisy with effusion which go on for many years, always coughing and expectorating a little, with very gradual loss of weight, with bronchiectasis, and perhaps, finally, apical cavity formation. These cases have many years of useful life here, beyond what they would have enjoyed in a less favorable climate.

There is one variety of phthisis little dwelt upon in the text-books which should be mentioned, for I believe the cases last much longer here than in lower lying regions. I refer to the type seen in certain young adults with moderate loss of weight, practically normal temperature, with little or possibly no appreciable dulness, but with constant cough, considerable expectoration containing abundant bacilli, great dyspnea, and upon examination, lungs bristling with fine moist râles. I have in mind three such cases, each of three to ten years' duration, with such slow downward progress that it can scarcely be noticed. I have never observed this type in New England, and doubt if it could exist there for such lengths of time. The prognosis is so much better as to time than one would at first believe that they should be carefully separated from the ordinary type, and sent to the high dry regions. The dyspnea may be severe for a time, owing to the obstruction of so many bronchioles, but the disease process does not seem here to extend to the lung tissue as one would anticipate.

Persons with a bad family history of tuberculosis may well consider the advantage of moving permanently to a high, dry region before the advent of signs of the dreaded disease. In cases where the lung does not entirely re-expand after pleurisy with effusion, two reasons should counsel us to send them to a considerable altitude. Firstly, the rarer atmosphere favors the expansion of the crippled lung; and secondly, the development of tuberculosis is thereby directly rendered less likely. In addition, we have the general antituberculous effect of the climate, even

though the lung cannot re-expand because of adhesions.

I think there is no question that glandular tuberculosis progresses more favorably here than at sea-level. This opinion is certainly held by Dr. Leonard Freeman and other surgeons of Colorado who have had experience both here and in large cities of the East.

Many cases of asthma are permanently relieved in this climate. The less the association with asthma, or its twin evils, chronic bronchitis and emphysema, the greater the chance of such permanent relief. If, however, the emphysema be not extreme, or associated with weakness of the right heart, such cases may be safely regarded as favorable for altitude treatment. The well-known purity of atmosphere of higher regions does much more good than the decreased density of the air does harm, the relief of the spasmodic element and of the bronchitis being the striking features in bringing about the improvement.

Almost constantly in those who have lived for many years in our mountains one may observe an increased chest development virtually amounting to moderate emphysema. This is a compensatory process, because of the need of great lung surface. Its origin, however, should teach us that the improvement in asthma and chronic bronchitis in this region is in spite, if not on account, of the emphysema. On the plains of eastern Colorado the lesser altitude is more favorable for cases with decided emphysematous changes.

The complication of tuberculosis of the lungs by organic heart disease often causes difficulty in deciding where to send a patient. I think we shall generally be right if we respect most the predominant condition. If any material dyspnea be caused by the heart trouble, only an incipient tuberculosis would probably be susceptible of improvement in a high altitude.

I do not observe any especial difference in the behavior of valvular heart disease or myocardial affections at Denver from that at sea-level if compensation be good. If it be on the point of failing it is a risky experiment to send the patient to any great elevation. In such a patient, scarcely any condition is susceptible to improvement by altitude treatment.

Of late years a host of the victims of malaria from the South and Southwest, as well as those returning from our tropical possessions, seek recuperation in the Rocky Mountain region.

The anemia and enlarged spleen are commonly ameliorated rapidly, and the absence of further infection is of great advantage. In those recently from the South we occasionally see outbreaks of ague, and I have seen, since the Spanish war, the only two pernicious malarial paroxysms that I have ever heard of in Colorado, both in newcomers. I know of no condition more certain to be benefited by the climate of the Rocky Mountains than the one we mention. I have seen many soldiers returned from Cuba and the Philippines who had suffered from the graver forms of ague, and practically all recovered completely, though often with severe relapse. This is also, so far as I know, the general opinion of the medical officers of the army.

The well-recognized increase in the number of red cells and the percentage of hemoglobin in certain anemias, upon removal to higher altitudes, is sufficient ground for the belief that the secondary anemias at least do rather better there than elsewhere. I know of no such influence in pernicious anemia. It certainly occasionally develops in those who have long lived in Colorado. I have recently seen a case in a man who has resided there for more than thirty years.

Certain cases of hay fever do wonderfully well with us, but some atrocious cases develop in the farming regions of Colorado, especially, perhaps, from the cottonwood tree and from alfalfa.

Those exhausted by prolonged summer heat find in the cool bracing nights of the mountains a tonic which cannot be obtained at home.

I know of no especial influence upon most other diseases aside from those of the nose, throat and ear, which others are more competent to discuss.

MEDICAL PROGRESS.

MEDICINE.

Syringal Hemorrhage into the Spinal Cord.—The etiology and the symptoms of this interesting but happily rare condition, is presented by Sir WILLIAM GOWERS (Lancet, Oct. 10, 1903), and several of his most interesting cases cited. Perhaps the most characteristic sign presented is the pain, which is described as being so severe that it makes the patient shriek with agony, the legs feeling as if they were being broken across. The bulk of the pain, however, is locally over the spine, the referred pain being entirely secondary as regards degree. Such pain as this does not occur in simple myelitis. If the blood escapes into a cavity of considerable vertical extent, there is not much erosion of the cord at the seat of the hemorrhage until the cavity is filled. It is probable that the cavities into which these hemorrhages take place, may be in many cases regarded as congenital. Some authorities, however, differ from this. It is easy to understand how hemorrhage may readily occur into these preexisting cavities. They are irregular in position and in size, and therefore in their relation to the vessels. The adjacent gliomatous tissue which surrounds them seems to be readily broken down by the fluid they contain. Adjacent vessels are imperfectly supported and may easily give way. Furthermore this gliomatous tissue is extremely vascular and may be a source for the hemorrhage, without any reference to the larger vessels. The symptoms, therefore, will vary rather directly as the congenital spaces of the cord are greater or smaller and are surrounded by a more or less vascular area. Inasmuch as these spaces are distributed along the posterior cornua, it must be remembered that if distended by blood, they may compress the lateral columns. And if it extends forward to the central region, it may compress the anterior horn. To differentiate the condition from a cerebral lesion, it is important to note that the latter never causes complete paralysis of the arm without any affection of the face or leg. The sternomastoid is weakened on the side opposite to the paralyzed arm, not on the same side. The most important therapeutic point is to give absolute rest in every

case of sudden spinal palsy. This is especially important when pain suggests a hemorrhagic cause. Every effort should be made to reduce the blood pressure in the spinal cord. To this end the spine should not be the lowest part. Therefore, the posture of the patient is of great importance. In all cases where there has been an escape of blood, the influence of gravitation for good or evil is too often overlooked. Hence, in the case under consideration, the prone position should be maintained, or, if possible, the patient should be placed in a sitting position. Posture is of the utmost importance in the treatment of all acute affections of the spinal cord.

Epidemic Pneumonia.—An epidemic of lobar pneumonia is described by F. Spaet (Münch. med. Woch., Sept. 29 and Oct. 6, 1903), which was peculiar in that it occurred in a small country town where the hygienic conditions were excellent. Within two months 13.9 per cent. of the inhabitants had been affected. The course and physical signs were typical and in general severe, yet fatal cases and complications were rare. Epidemics of pneumonia are not common and generally occur where many people are herded together or else are secondary to influenza and then more irregular in type and marked by severe pains in the limbs and vomiting. One is forced to conclude that genuine lobar pneumonia is occasionally a contagious disease, though the conditions which enable it to spread are still unknown.

Occurrence of Bacteriuria.—The occurrence of idiopathic inflammation of the bladder in children is certainly rare when one considers that the prominent symptoms—tenesmus with discharge of small amounts of urine free from blood and pus—are rarely overlooked. D. Cnopf (Münch. med. Woch., Oct. 6, 1903) points out that autoinfection plays a prominent part, for the majority of patients were girls suffering from enterocolitis, where contamination of the genitals was hardly avoidable and the short urethra facilitated infection of the urinary passages. With boys, the explanation is somewhat more difficult, but it has been shown that bacilli can readily wander through lesions of the rectum into the bladder. Infection by way of the blood is not yet absolutely proven, though colon bacilli have been found in the circulating blood of infants suffering from enteritis. A bacteriological examination of the bladder-contents in such cases may show the presence of colon bacilli, even if there are no vesical symptoms. There must be some concomitant weakness of the bladder-wall induced by cooling off of the body, retention of urine or general intoxication, especially if the kidneys are much diseased. The symptoms may be very mild or very severe; in the latter case there is high fever, chilliness, nausea and constipation. The abdomen is exceedingly tender and burning, saturated urine is constantly voided in small amounts. On examination it contains albumin, mucus, pus, epithelium and even red blood cells. The colon bacillus, exceptionally the *Bacterium lactis aerogenes* or the *Diplococcus pneumoniæ* are found in large numbers. The condition may run its course in one to two weeks, but obstinate recurrences may follow. Ofttimes an obscure temperature-curve is due to this bacteriuria. Serious complications, such as urethritis, pyelitis, nephritis or uremia hardly ever occur in children, but treatment should be prompt and energetic. Urotropin internally is harmless in children and efficient, though it must often be given for weeks. Bladder irrigations with dilute antiseptics are of course in place.

Acute Leucemia.—The subject of this rather extensive report, by A. M. Yanoushkevich (Prakt. Vrach, Aug. 23 and 30, and Sept. 13, 1903) began to complain of severe pain in the throat, general malaise and loss of appetite; the pain passed off in a few days, but the weakness increased rapidly compelling the patient to give up his work. A week before admission he began to suffer from cough, dizziness, sweating and slight fever; in a few days thereafter there appeared a swelling under the upper lip, and an offensive odor from the mouth. There were no ecchymoses or petechiæ anywhere on the skin; the various glands but slightly increased in size. There were three ulcers on the reddened swollen gums. Auscultation of the arteries gives a distinct anemic murmur. The spleen is enlarged. Microscopic examination of the blood shows a marked increase in the white blood corpuscles, while the red corpuscles are of various sizes; there are also a few poikilocytes. The first count gave 52,500 white and 1,540,000 red corpuscles, and 4.86 gr. hemoglobin (Glan's method). The urine contained a trace of albumin; otherwise normal. The temperature kept gradually increasing; there occurred convulsions in the right foot, followed by convulsive twitchings of the head which lasted for two minutes. The ulcers meanwhile coalesced, forming a large, offensive, painful wound; odor from the mouth intolerable. The glands began to swell, the pulse became weaker, 156, respiration 38, condition of patient, comatose or delirious; complains of blindness, general hyperesthesia; the last count of blood corpuscles showed 165,000 white and 740,000 red (1:4.5), hemoglobin 2.1 gr. Patient died on the tenth day of his admission to the hospital with symptoms of severe dyspnea and cardiac weakness. The autopsy fully verified the antemortem diagnosis of leucemia; the most important alterations were as follows: Gangrene on the inner surface of the entire upper lip and part of the gums; fatty degeneration of the cardiac muscle; enlargement of various glands with hemorrhages into their tissues; lymphomata in many of the organs; enlargement of the spleen to almost double its normal size. Enlargement of the intestinal follicles as well as of Peyer's patches. Alterations in the bone marrow of the sternum and ribs, and so on. It is interesting to note in connection with this case the absence of a very important symptom of such a condition, namely hemorrhagic diathesis; the author is inclined to ascribe this absence either to some special individual characteristic of the patient's system, or to the character of the poison which in this case failed to exert any deleterious effect on the endothelium of the blood vessels.

Question of Meat Diet in Nephritis.—Some clinicians forbid meat in nephritis since this is rich in proteid and is apt to increase the percentage of albumin in the urine. T. R. Offer (Centralbl. f. d. g. Therap., Sept. and Oct., 1903) shows, however, that this is based upon an erroneous calculation and that with a strict milk diet more proteid is often ingested than where a moderate amount of meat is allowed. Restriction of dark meat is still advocated by many, owing to the larger amounts of extractive matter present, which is supposed to irritate the kidneys. According to the writer's accurate chemical analyses however, the differences are so slight as to be of no practical value. When meat is roasted, a certain amount of extractive matter passes over into the sauce and this is more pronounced in the case of dark meat, so that beef-steak would really be more permissible than roast veal.

Condition of the Stomach in Tuberculosis.—According to A. Robin and E. Du Pasquier (Bull. Gen. de Therap., Sept. 30, 1903), the stomach suffers in every stage of tuberculosis. In the earliest period one encounters hyperacidity most often. The patients will complain of pyrosis, acid regurgitations and a number of disagreeable sensations during digestion or five or six hours later. The symptoms are intermittent and there are even times when they will boast of an ex-

cellent stomach. The appetite is capricious, the tongue appears normal and constipation is not rare. Vomiting when present, is rather characteristic, in that it is not accompanied by nausea or pain. The hydrochloric acid rarely exceeds one gram to the liter and sometimes a variable amount of lactic and butyric acid is present. During the second stage, when the tubercles undergo softening the gastric juice is found normal or of diminished acidity. Finally, in the stage of cavity-formation, the secretion will be entirely insufficient and a chronic gastritis with mammilated mucous membrane and interstitial periglandular inflammation will supervene. Anorexia is present, digestion is accompanied by feelings of oppression and foul-smelling regurgitations and vomiting are common and preceded by nausea and pain. The stomach contents contain only a trace of free acid, pepsin is much diminished, and rennin entirely absent. Diarrhea often accompanies the gastritis and hastens the end. The initial hypersecretion is explained by the authors by an irritation of the vagi, the final hyposecretion by the cachexia.

Tuberculin Test in Consumption.—It is often impossible to detect by means of physical examination, if a patient is suffering from incipient tuberculosis or if a formerly active process has passed into the latent stage. For such cases, E. FISCHER (Correspbl. f. Schw. Aerzte, Oct. 1, 1903) finds the tuberculin test invaluable. A patient may feel well and gain in weight and the physical signs may be insignificant, so that the physician is inclined to pronounce the case cured. Yet a rise of temperature may follow an injection of tuberculin which indicates that another course of hetol treatment is in place. A cure is thus established on an exact scientific basis and is no longer guesswork. In one apparently advanced case, no reaction followed, so that the patient, who was hitherto regarded as a hopeless consumptive, could be definitely cured of his lung abscess.

Stomach Contents in Various Diseases.—VOTRUBA and MIXA (Bull. Gen. de Therap., Oct. 8, 1903) have systematically examined the stomach contents in a large number of diseases with the following results: In tuberculosis there is hyperchlorhydria and hyperpepsia at first, later hypochlorhydria with varying amounts of pepsin and rennin. Nephritis is generally marked by hypochlorhydria with normal amounts of pepsin and rennin. Hypochlorhydria also goes with osteomalacia. No constant figures were obtained in diabetes mellitus, chlorosis, neurasthenia, or hysteria. With cancer and ulcer of the stomach, the usual characteristics were found. No parallelism between acid, pepsin and rennin could be found in the various diseases studied. In hypochlorhydria, hydrochloric acid is indicated, but where there is an excess of acid, calcined magnesia has a much more lasting effect than bicarbonate of soda.

The Blood in Congenital Heart Disease.—An interesting and fairly constant symptom accompanying the cyanosis of congenital heart lesions is a marked increase in the number of red blood cells. In a series of cases observed by E. FROMHERZ (Münch. med. Woch., Oct. 6, 1903) figures as high as 9,800,000 were obtained. In one case where the autopsy subsequently revealed pulmonary stenosis and open foramen ovale, a peculiar attack was noticed several months before death. The patient suddenly became almost completely black in the face and suffered from extreme dyspepsia, while the heart action was heaving and the pulse strong and hardly increased in frequency. Probably a dilatation of the right auricle had taken place and most of the blood had passed directly into the left auricle and from there into the general circulation, instead of right ventricle and pulmonary circulation. The increase of red cells is to be looked upon as a compensating change. Since the amount of blood flowing through the lungs is less than normal each given amount of blood must present a larger oxygen-absorbing surface to meet the demands of the body. Despite this, cyanosis is common since the number of red cells in each cubic centimeter has its limits and can rarely exceed 8,872,500, if the cells are of normal size.

Serum Therapy of Scarlet Fever.—If it is taken for granted that all streptococci are closely related, it would seem that all antistreptococci sera ought to be able to exert a specific influence on scarlet fever cases. In a discussion of this question, H. SCHILLER (Medicine, Oct., 1903) points out that experiments have shown that sera which have been produced with virulent and unchanged streptococci agglutinate very promptly all the forms of streptococci, and this variety of sera should therefore produce the best results in treating scarlatina. Sera of this type are those of Moser and Tavel. The author reports two cases in which the prognosis was very bad. They were combined with sepsis and the usual measures including the use of unguentum Credé did not produce any improvement. Resort was then had to the ordinary antistrepticoccus serum sold in the open market. This is prepared after the manner of that of Marmorek, and was used because neither of the other types could be obtained. From 15 to 20 c.c. of the serum was injected in each case, on two occasions from three to five days apart. The improvement was almost immediate, the general condition improved, temperature fell, pulse grew stronger, and the glandular swellings became reduced. Relapses had occurred in each case before the second injection of serum, due probably to a renewed invasion of the system by streptococci originating in the glands. The reaction, however, was prompt.

What Drugs Can One Use Against Diabetes?—KAUFMAN in Gazz. degli osped., (Oct. 6, 1903) makes a systematic study of various methods of treatment of diabetes. In 11 observations, opium or its alkaloids were used, six times successfully, three times unsuccessfully, two with doubtful results. Bromides are useful where glycosuria is combined with neurasthenia. Bichloride of mercury diminished the sugar in many cases, but was without result in one-third of the patients. Carbolic acid was without effect in 11 cases of grave glycosuria; in five cases there were some results, in two cases the result was favorable. Salicylates had no harmful results, except in diminishing the appetite. Salol worked better. Antipyrene administered to seven diabetics had no effect except in disordering the gastro-intestinal tract. Piperazine increased the glycosuria in one case. Jumbul, in two cases, produced a distinct improvement, in three the effect was slight, and in two was absolutely negative. The author concludes that opium, salicylates and jumbul are the only drugs that modify glycosuria; he advises opium in severe cases with serious complications, and salicylates in milder cases or after a course of opium treatment.

Transmission of Tuberculosis.—During recent years it has been the general belief that tuberculosis is acquired usually by the inhalation of the tubercle bacilli into the respiratory tract. That this is a frequent method of infection must be acknowledged by all, but the fact that infected food is the means of communication in a large number of instances, even when the lesions of the disease appear first and principally in the respiratory tract, is being urged by a great many authorities. J. O. COBB (N. Y. Med. Jour., Oct. 3, 1903) cites the experiments of Nicholas and Descas, who fed fasting dogs on tuberculous sputum and in several instances were able to detect tubercle bacilli in the thoracic duct three hours after such ingestion, even when no lesion could subsequently be detected in the intestinal tract.

Even in the intraperitoneal inoculation of guinea-pigs it is frequently noted that the lungs manifest extensive lesions when there has been very little involvement elsewhere. It is not unreasonable to suppose that the tubercle bacilli when free in the blood locate by preference in the lung tissue just as other germs which seem to have a predilection for particular tissues of the body. The probability is that cows almost always acquire the disease through their food, and it is a simple matter to understand how this is possible. They frequently lick the same lumps of salt and drink from the same troughs or even eat from the same bins. By coughing they probably infect the food or receptacles before them. The infection of swine by means of the gastro-intestinal tract as the usual manner is undisputed. It is more difficult to prove the mode of infection in man, but it is contended that the gastro-intestinal tract is a very frequent avenue of entrance. The food and water used by a family, in which there are one or more careless tuberculous patients, can be very easily contaminated. Flies undoubtedly serve as carriers of tubercle bacilli, for sputum is always especially attractive to them, and the presence of bacilli has often been demonstrated upon their probosci.

Quincke's Disease.—This disease, first studied by Quincke in 1882, is an angioneurotic edema, according to BASTOGI (Riv. critica di Clin. Med., No. 32), acute, idiopathic, but circumscribed, the swellings are from 2 to 10 cm. in diameter. It seldom affects the mucous membranes, is temporary, generally soft, elastic, white or red, indolent, accompanied by a sensation of tension. It returns frequently, with evident periodicity, and is sometimes hereditary. It usually involves the superficial layers of the skin, but sometimes invades the subcutaneous tissue. It attacks the extremities, the lids, the labia, and, less frequently, the trunk. It has even been seen in the retrobulbar cellular tissue causing exophthalmos. The symptoms vary according to the location of the edema. In cases of edema of the glottis or larynx it can become fatal. The most common cause, when it can be determined, is refrigeration or traumatism. Emotional shock, deficient nutrition also produce it. The cause is a local change in the minute blood vessels, and their vasomotor nerves causing a slowing of the circulation of the blood, from some local toxemia probably, capable of provoking acute saturation of the tissues with serum. An irritation of the vasodilators rather than a paralysis of the vasoconstrictors is probable. This irritation increases the serous secretion by the change in the blood and in the walls of the blood vessels. Some cases present a symmetrical involvement of different areas, suggesting a central origin. These cases are accompanied often by vomiting. Acute angioneurotic edema is to be distinguished from edemas of mechanical origin, from inflammatory, nephritic, or myxedematous origin; also from edema occurring in cases of hemiplegia, tabes and hysteria. The various cases of angioneurotic edema reported in literature have been associated with grip, articular rheumatism, gastro-intestinal disorder, uricacidemia, or gout. Other cases seem idiopathic, and not associated with any other diathesis or condition.

Syphilis and Suicide.—Four classes are mentioned (ALFRED FOURNIER, La Presse Med., May 20, 1903): (1) Cases where the suicide is the result of a mental trouble arising directly from the syphilis; (2) cases where suicide is the result of despair of the patient, who has suffered from external syphilitic symptoms, which are of a serious nature, or so considered by him; (3) cases associated with the original announcement to the patient that he is syphilitic; (4) cases depending on the social situation where syphilis has definite relations with marriage, or social standing. The first group includes those cases, the most numerous of all, where a mental trouble is directly the result of the syphilis, that is to say, a syphilitic encephalitis, a gumma of the brain, a general paralysis of the insane, referable to the infection. In certain forms of syphilitic encephalitis suicide is a symptom, and at a very early period of the disease. It appears so suddenly that it overpowers the patient who has been in an absolutely quiet condition. It may appear after many years, or in cases of hereditary syphilis. In the second class, where shame of suffering a venereal disease or a disfiguring ulceration of the face, the writer advises all physicians to appreciate the special mental and moral attitude of his patients, so as not to be taken unaware by suicide from this cause. In the third case, where suicide follows the first notification of syphilis, the fault lies in an abrupt, tactless announcement on the part of the physician, to patients who are syphilophobiacs.

Excretion of Ammonia in the Urine.—The amount of ammonia excreted in the urine remains the same no matter whether much or little proteid is injected or if meat is allowed or not. A. SCHITTENHELM (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 5 and 6), however, finds that with a fatty diet, the amount of ammonia at once increases owing to an overloading of the organism with fatty acids and their decomposition products. Where there is no free hydrochloric acid in the stomach and the total acidity of the test-meal is low the amount of ammonia obtained from the urine is low also, and conversely, so that the gastric secretion seems to have a marked influence. In chronic degenerative disease of the liver there is also a general acidification, with greater excretion of ammonia. If now fat is given the figures obtained will be higher than in the normal organism.

Behavior of Leucocytes in Various Diseases.—The white cells were carefully counted in a number of diseases by P. REKZEH (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 3 and 4), in the hope of finding constant relations of diagnostic value. The results were briefly: (1) In mercurial dermatitis, a slight increase of leucocytes by 1 or 2,000, the large lymphocytes and transitional forms occasionally increased, mononuclear elements normal, polynuclear leucocytes diminished and eosinophiles somewhat more abundant. These changes were all independent of the syphilis present. In excised pieces of altered skin eosinophiles were also abundant; they were more numerous in capillary blood, taking from the neighborhood of the eruption, than from venous blood. Their presence is accounted for by the irritation caused by the breaking down of epithelial cells. (2) Scarlet fever. Here an eosinophile increase independent of the general leucocytosis was present, which reached its acme when the eruption began to fade. The percentages varied between 1 and 12.5 in one series (children), between zero and 23 in another (adults); the average number was 8 per cent. at the height of the disease. (3) Measles was characterized by an absence of leucocytosis (4,200 to 4,800, with eosinophiles between zero and 5 per cent. in children and zero and 4 per cent. in adults. The greatest percentage was here also obtained during the fading of the eruption. (4) Erysipelas gives rise to a marked polynuclear leucocytosis with diminished lymphocytes, and complete absence of eosinophiles. (5) Diphtheria. A leucocytosis proportionate to the severity of the disease and due chiefly to increase of lymphocytes. In four cases myelocytes were found and in one a relative lymphocytosis was present four days before the onset of clinical symptoms. The eosinophiles were normal or diminished. (6) Leucemia. The eosinophiles varied here between 1 and 14.6 per cent., and were most abundant in the relatively benign and myelogenous types. (7) Pernicious Anemia. Here also an eosinophile leucocytosis is present only in the milder

cases, but high figures were never obtained (1 to 2.5 per cent.)

Diagnosis of Bone Metastases from the Blood.—The article of O. KURPJUWEIT (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 5 and 6) forms an interesting contribution to blood-pathology. This author finds that if besides the indications of a severe anemia, a large number of myelocytes (4 to 17 per cent.) are present in the blood, even if the clinical picture is obscure, the diagnosis of malignant tumor with metastases in the bone may be made without hesitation. Myelocytes occur in the blood in small numbers (fractions of a per cent.) in diphtheria, pneumonia, and malignant tumors without metastases. They are found more abundantly in leucemia, but here poikilocytosis is absent, mast cells are increased and eosinophile cells are more common. Clinically leucemia and malignant secondary tumors in the bone may be very similar; in both there is advanced anemia, tenderness of the bones, hemorrhagic diathesis and an irregular fever. The absence of enlarged spleen and lymph-nodes will, however, speak against a leucemia. In pernicious anemia, myelocytes will never reach such high figures. The myelocytes in malignant tumors appear only when secondary nodes form in the marrow; they are a manifestation of disturbed hematopoietic function.

PHYSIOLOGY.

Contributions to the Physiology of the Kidneys and of Diuretics.—The diuretics are divided into three groups by W. v. SOBIERANSKI (Pflüger's Archiv, Aug. 8, 1903). To the first belong caffeine and similar bodies, which principally lessen the resorptive powers of the contorted tubules and thereby bring about diuresis. In the second group are to be placed all the salts, which increase chiefly the filtration and osmotic properties in the glomeruli. The third class includes all those bodies, which in their effect, make them intermediate between the two other classes. These bodies are urea and kindred substances. In studying the histological effects of saline diuretics on the kidney, the author found a pronounced dilatation of masses of tortuous uriniferous tubules. Most characteristic was the appearance of a brush-like border in all those tubules of the above type with low epithelium. This is so typical that it undoubtedly is connected with the phenomenon of saline diuresis, and is to be regarded as a manifestation of the hygroscopic properties of the salts. The latter in the blood prepare the way for diuresis, which accordingly occurs in the glomeruli. As soon as the urine secreted in the Malpighian bodies reaches a certain concentration of salt, there occurs in the contorted tubules a shrinkage of epithelium, as the result of the hygroscopic action of the salt; hence the brush-like border of the epithelium. As soon as the saline concentration of the blood and urine sinks, the capacity of the epithelium to swell to its normal size has the upper hand. Thus, saline diuresis manifests itself in the kidneys by the play of two forces, the one determining the greater filtration of the urinary constituents in the glomerulus, the other consisting in the effect of concentrated saline solutions upon the uriniferous tubules. There results an osmotic struggle between the resorptive capacities of the epithelium of the contorted tubules and the hygroscopic properties of the salts. Caffeine hardly changes the form of the epithelium of the contorted tubules but increases their resorptive power. Urea lessens this power but exerts, when administered in large amounts, the same effect as salines.

The Digestibility of Vegetables.—An experimental contribution by A. P. BRYANT and R. D. MILNER (Am. Jour. Physiol., Oct. 1, 1903) indicates that so far as sources of protein or fat are concerned, the vegetables studied (potatoes, cabbage, apple sauce and green corn) may be considered as of little value. They do, however, contain carbohydrates, which the results of these and other experiments indicate to be quite well digested and absorbed; and they may, therefore, be considered as of value as sources of energy, a large proportion of which appears to be available to the body. The chief value of many vegetables, however, is perhaps aside from the nutrients or energy they furnish; they add a pleasing variety and palatability to the diet, supply organic acids and mineral salts, and give the food a bulkiness that seems to be of importance in its mechanical action in maintaining a healthy activity of the alimentary tract. Perhaps the result of these conditions is a favorable influence upon the digestion of other food eaten with the vegetable; at least such an effect was suggested by the results of some of the experiments.

Gastric and Intestinal Peristalsis.—A new experimental method of studying the peristaltic waves of stomach and intestines under different conditions, has been employed by F. LOMMEL (Münch. med. Woch., Sept. 22, 1903). Small dogs were fixed in the right lateral position and fed with milk or finely divided meat to which 15 per cent. bismuth subnitrate had been added and then Roentgen rays allowed to pass through the body from the right side below to the left side above. After two to six minutes distinct rhythmical waves began to appear at the large curvature. These rapidly became more distinct and extended to the pylorus, which became distinctly tube-shaped after nine to fifteen minutes. Ten distinct waves required about two minutes. The application of warmth did not increase the number or rapidity of the waves and likewise cold was of little influence. The addition of certain substances, such as somatose seemed to stimulate peristalsis. The influence of psychical conditions was very apparent. In restless animals or animals suffering pain during the experiment, no gastric movements were noticed for as long as two to three hours. Concerning the intestines, there is no question that antiperistaltic waves occur under normal conditions. Both stomach and intestines contract rhythmically and distinct periods of rest follow each larger wave.

The Differential Recognition of Human Blood from that of Other Animals.—Bordet has some time ago established the following fact: If the red blood corpuscles of a certain animal be introduced hypodermatically into the blood of another animal there will be formed in the serum of the latter substances possessing certain properties toward the blood of the first animal, known as agglutination, and hemolysis. This action is specific, inasmuch as the serum shows its effect only toward that animal and is inert as regards any other. The same is proved to be the case with other fluids of the body, such as milk. Several investigators went further in these experiments and established what is known as the biological method of differentiating the blood of man from that of other animals. P. N. DIATROPTOFF (Roussky Vrach, Sept. 13, 1903) resorted to this method in the rather notorious case of the murder of a boy said to have been committed for ritual purposes and which served as the immediate cause of the Kishineff massacre. The question to be decided (besides controverting the obstinate rumors fostered by certain people) was as to whether the blood found on the boy's clothing was human or not. To obtain the requisite serum, blood serum from man was injected into a rabbit. The human blood was collected from the mother's end of a cut placental cord into a sterilized tube, and then subjected to centrifugal action. During a period of twelve to sixteen days each rabbit received between 60 and 80 c.cm. of human serum. Six

days after the last injection the blood obtained from an experimented rabbit was compared with the blood of a healthy rabbit. Two drops of human blood in 5 c.cm. of a physiological salt solution when mixed with ¼ c.cm. of the serum from the experimental animals caused in one-half hour marked turbidity, and later on a sediment; while a mixture under the same conditions of horse's blood, or of human blood with that of another rabbit failed to give any reaction. The examinations of the dried blood on the boy's clothing took place four months after the presumed murder, and gave undoubtedly positive results. The author considers this biological method of blood examination of immense importance in legal medicine. The reaction is very evident and remains so for a considerable time, for almost two days.

Qualitative Difference of Spinal Reflex Corresponding with Qualitative Difference of Cutaneous Stimulus.—Qualitative differences between spinal reflexes provoked from the skin, according to C. S. SHERRINGTON (Jour. of Physiol., Aug. 24, 1903), are usually distinguished only in so far as dependent on differences in the regional locus of their initiation. But the variety of species of sensation elicitable from the skin suggests that possibly different reflex motor reactions attached to the different species of end-organs undoubtedly coexisting in one and the same skin field. The author found in experiments on dogs that this is really the case, the different kinds of nerve-endings situated in a certain cutaneous area possessing reflex spinal connections differing wholly inter se. For discrimination between certain sets of end-organs in the skin there are, in fact, available not only psychological criteria involving processes of sense, but data purely physiological with characteristics given in tensions of the musculature.

The Formation of Uric Acid in Birds.—The literature on the subject of the origin of urea in mammals and uric acid in birds is richly increased by the contribution of T. H. MILROY (Jour. of Physiol., Aug. 24, 1903). He found that such a mineral acid as hydrochloric acid in doses smaller than those which result in acid-poisoning, affect the uric acid synthesis, diminishing the transformation of ammonium salts into uric acid. The same occurs with lactic acid but on neutralization the effect is no longer produced. Galvanic stimulation of the liver aids the synthesis, while the presence of the electrodes alone inhibits it. When galvanic stimulation of the liver is employed in the case of birds under the influence of acid, the action of the former prevents the latter making itself felt. Although the excretion of uric acid is raised by giving nucleic acid, it is not certain that this is due to a direct origin from the purin radicle. The results which were obtained on giving hypoxanthin and caffeine, unlike those described by v. Mach, also tend to show that the direct transformation of purin bases into uric acid is not an important mode of origin in the bird.

The Proteolytic Activities of the Pancreatic Juice.—The just criticism is made by W. M. BAYLISS and E. H. STARLING (Jour. of Physiol., Aug. 24, 1903) that although one of the earliest of the modern researches on the pancreatic juice, namely, that of Corvisart, was made on the pancreatic juice itself, as secreted into the duodenum, nearly the whole of the modern ideas on this subject are based on experiments carried out, not on the juice, but on extracts made in various ways from the gland itself. The authors find that under no circumstances does the pancreatic juice, as secreted, contain trypsin. Fresh pancreatic juice contains trypsinogen, and a weak proteolytic ferment resembling somewhat erepsin. This latter will digest fresh fibrin, or caseinogen, but has no influence on coagulated proteid or on gelatin. Trypsinogen is a stable body, only slowly altered by standing in alkaline or acid solutions. It is converted into trypsin by enterokinase. No other substance can effect this conversion. Trypsin is not an expression for two bodies, enterokinase and trypsinogen acting together, but is a third substance produced as a result of the interaction of these two bodies, *i.e.*, enterokinase acts on trypsinogen like a ferment (Pawlow) and converts it into trypsin. This substance is extremely unstable, and is rapidly destroyed, especially in alkaline media, and at the body temperature. This autodestruction is greatly retarded by the presence of dissolved proteids or peptones. Enterokinase is a product of the secretion of the small intestine, and mainly of its upper end, but of no other parts of the body. It is not found in blood fibrin, lymphatic glands, or leucocytes. The smallest trace of enterokinase will convert a large quantity of trypsinogen into trypsin if sufficient time be allowed. It is stable in watery solutions at 15° C., but is rapidly destroyed at 40° C.

Observations on Precipitins.—Rabbits were treated with injections of the separated proteids of oxserum by A. HUNTER (Proc. Physiol. Soc., Jour. Physiol., Aug. 24, 1903), and precipitins were obtained in every case, but the most striking fact noted was that any injection performed on a rabbit whose serum was already rich in precipitin, led to an immediate diminution, and indeed usually to a complete disappearance of the precipitating substance from the blood. It was only gradually reproduced, reappearing about the second or third day, and attaining its maximum amount about the fifth or sixth day. Each successive maximum was of course higher than the previous one. The leucocytes followed a course exactly inverse to that of the precipitins.

The Effect of Prolonged Putrefaction on the Nuclein Bases of Feces.—The results of a series of experiments performed by A. SCHITTENHELM (Hoppe-Seyler's Zeitsch., July 31, 1903) show that prolonged putrefaction causes the disappearance of the nucleins from the feces, with the exception of a small residue. Undoubtedly this disappearance is to be attributed to the decomposition effects of bacteria, either alone or with the aid of ferments.

The Effect of Enhydrina Poisoning.—One of the commonest of the very poisonous *Hydrophidæ* or seasnakes is the *Enhydrina Bengalensis* according to L. ROGERS (Proc. Physiol. Soc., Jour Physiol., Aug. 24, 1903), its venom being 10 times as powerful as that of the cobra. It produces complete paralysis of the phrenics and partial paralysis of the sciatics, and causes the blood to become very dark in color and to clot firmly and quickly when removed from the body. There is a typical paralysis of the respiratory centers and motor end plates, the latter being most marked in those of the phrenic nerves, this resembling that produced by cobra poison.

The Products of the Proteolytic Action of an Enzyme Contained in the Cells of the Kidney.—The following substances have been identified by H. D. DAKIN (Jour. of Physiol., Aug. 24, 1903) as products of the action of the kidney enzyme, recently discovered by Hedin and Rowland; the enzyme acting in acid solution: ammonia, alanin, and amnioisovaleric acid, leucin, pyreolinie carboxylic acid, phenylalanin, tyrosin, lysin, histidin, cystin, hypoxanthin, nidol derivatives which in some cases gave the reactions of skatol-amido-acetic acid, together with an insoluble residue of paranuclein. In the main the products of the intracellular enzyme are identical with these of the ordinary extracellular tryptic digestion of proteids, although arginin and aspartic acid were not formed in appreciable quantity.

The Influence of Carbohydrates Upon the Putrefaction of Proteids.—A theoretical and experimental

study of this question is offered by S. SIMNITZKI (Hoppe-Seyler's Zeitsch., July 31, 1903). Considered from the theoretical standpoint, he believes it is probable, in opposition to the theory of Pasteur, that animal life is possible without the presence of bacteria in the intestine. This was established experimentally by Thierfelder and Nuttal. On the other hand, the researches of Schottelins on hens showed that whereas life is possible without intestinal bacteria, yet the development of the organism is not a normal one and there is a diminution in the energy of the vital manifestations, when the contents of the intestine are sterile. The advances in the knowledge of intestinal auto-intoxication led to a search for remedies, and following on the one hand the suggestion of Bouchard with regard to intestinal disinfection, various pharmaceutical agents were tested, and on the other hand the result of empiricism, the influence of various dietetic measures was tested. The investigations of Biernacki and Eisenstadt showed that the carbohydrates have only a slightly inhibitory action upon intestinal putrefaction. With regard to a milk diet, many authors are unanimous that this leads to a marked diminution in intestinal decomposition. These authors do not agree, however, as to what constituent or constituents of the milk are responsible for this effect. The following suggestions have been made, namely: (1) casein, unlike the other proteids, is less apt to undergo putrefaction; (2) milk sugar prevents putrefaction; and (3) this process is prevented by lactic acid and other decomposition products of milk. Experiments on the treatment of wounds performed during the brilliant age of antisepsis, have shown that concentrated sugar solutions are capable of influencing the vitality of bacteria, and this was practically applied in the cleansing of wound-surfaces. In 1888, J. Bey suggested the use of ordinary sugar-syrup in the treatment of burns. The progress of bacteriology has rendered it possible to teach that suger, even in very weak concentrations, has at times an unfavorable influence upon the vital manifestations of certain bacteria, for example, the *Staphylococcus pyogenes aureus*. It naturally appeared to be of some interest to determine the fate with respect to intestinal antisepsis, of sugar administered per os. The experiments of the author showed the following: The decomposition processes of sugar and proteid begin in putrefying mixtures at the same time, but do not proceed proportionately. The presence of sugar inhibits the decomposition of proteid by bacteria, and the quantity of decomposed albumin stands in reciprocal relationship to the content of sugar in putrefying mixtures. The various forms of sugar have a different effect; the inhibitory effect of milk-sugar (50 per cent. solution) is greater than that of similar solutions of grape-sugar and galactose, while the effect of grape-sugar is greater than that of galactose. The acids formed from sugars taken in by the mouth, have a similar effect; lactic acid, as well as it salts, has an important action in the prevention of the decomposition of proteids.

The Composition of the Blood-proteids in a Case of Alcaptonuria.—This is an hereditary disease characterized by the presence of homogentisinic acid in the urine. Tyrosine and phenylalanin have been recognized as the mother-substances of homogentisinic acid. E. ABDERHALDEN and W. FALTA (Hoppe-Seyler's Zeitsch., July 31, 1903) found in a case of alcaptonuria, the presence of homogentisinic acid in the blood, and that the proteids of the blood in this case contained tyrosin and phenylalanin and in the same proportion and amount as these are present in the blood of normal individuals. This proved that the disturbance underlying alcaptonuria is to be sought neither in the intestinal canal nor in the process of absorption. It depends upon the quite localized, specific disturbance in the catabolism of proteid. This has been found also to be the case in the cystindiathesis.

NEUROLOGY AND PSYCHIATRY.

Bladder Center in the Cortex.—The fact that children obtain full control over the bladder only as their intellectual faculties develop, makes it probable that a cortical center controls the innervation, besides the lower centers in the cord and sympathetic ganglia. Almost conclusive proof is offered by a case of M. FRIEDMANN (Münch. med. Woch., Sept. 15, 1903). A boy sustained a fracture of the vertex of the skull without any focal symptoms, except that there was at first a difficulty in urination and later, incontinence, which persisted for over a year. The site of injury corresponded to the upper third of the posterior central convolution, directly behind the arm center. Why the other hemisphere did not assume vicarious function could not be explained.

Brain Surgery in Epilepsy and Idiocy.—Great hopes have been held out from time to time by surgeons who have operated upon cases of epilepsy and obtained what appeared to be temporarily, at least, very favorable results. A careful investigation of these cases later, however, almost always tends to reduce the ardor of enthusiasm for surgical interference. Cases for operation must first of all be carefully selected for there is only a small percentage of epileptics upon whom an operation is justifiable. The epilepsies which affect the motor side of the body promise most for surgical treatment. When the attacks are psychical, or silent in form, causing no commotion in the muscular system and no change in posture, surgery can be of little avail. Operations should be confined to cases in which the attacks are of *grand mal* or Jacksonian type, and will seldom be found of value in the *petit mal* or psychic type. W. P. SPRATLING (N. Y. Med. Jour., Sept. 12 and 19, 1903) reports 33 cases of epilepsy operated upon, most of them being carefully selected and offering the best chances of benefit. In 21 there was no improvement either temporary or permanent. In 8 the attacks were lessened in frequency and severity, the operation being a part of the treatment only. In 3 the disease was much worse after the operation. In one, in which there was apparent recovery, the operation was done for the removal of the uterus and appendages, which were seriously diseased and which evidently periodically produced a form of auto-intoxication. In only four was there any decided improvement and it was impossible to say how much benefit was derived in these cases from the medical treatment which was also maintained. Certainly these results are not very hopeful. It should be said, however, that there was no death from operation. In regard to idiocy the results from operation are even less bright. There are, of course, many cases of idiocy in which it would be the height of folly to attempt any operation. Some cases of hydrocephalus, microcephalus or premature ossification of the fontanelles and sutures would appear, theoretically, at least, to offer some hope of relief. A report of 83 cases, which had been followed for some time after operation, showed that 20 died from the operation itself or soon afterward; 54 were unimproved, and only 9 were benefited. The 9 who were improved showed it mostly in being quieter. This must not be taken for a gain in mental power for it frequently means the opposite. Jacobi says: "It appears in the face of so many deaths and so few results, that the operation is not promising to mankind. The operations thus far performed do not effect what they were intended for; they do not even enlarge the cavity."

THERAPEUTICS.

Bromide of Methyl Atropine.—A further experience with atropine in the treatment of asthma has led G. CAMPANELLA (Gazz. Osped., Sept. 20, 1903) to give the preference to the bromide of methyl atropine; this preparation being, in his experience, devoid of the untoward effects of atropine sulphate, and in many instances relieving the dyspnea within a few minutes, when injected in the proportion of from a half to three quarters of a Pravatz syringeful. Though conferring almost immediate relief of the respiratory distress, the remedy induces dryness of the throat and, in some patients mydriasis with clouded vision, and ischuria.

Treatment of Anthrax with Oxygen.—The various methods of treating anthrax are reviewed by G. BARNICH (Jour. Méd. de Bruxelles, Sept. 24, 1903) who has had his best results from local application of a current of oxygen gas. This is accomplished, when the pustule has broken down, by directing, upon all parts of its surface, a current of oxygen from a cylinder containing the gas under a pressure of twenty atmospheres. This treatment is continued for fifteen minutes and is supplemented by injections of the gas into the surrounding tissues by means of a Pravatz needle attached to the end of the delivery tube, and compresses saturated with dilute peroxide of hydrogen. If the anthrax be seen in the stage of tumefaction before suppuration has set in, injections of the gas into the tumefied tissue and surrounding inflammatory areola, followed by a dressing saturated with peroxide frequently suffice to abort the pustule. The Pravatz needle should be inserted at numerous points, and at each introduction the gas should be allowed to flow for about a half minute or until gaseous crepitation is felt; the tumor being thus isolated, as it were, in an atmosphere of oxygen. From one to two treatments usually suffice to effect a cure.

Spurious Creosote.—The secretary of the New York Board of Pharmacy, C. S. ERB (Merck's Report, Oct., 1903) finds on personal investigation that a number of New York druggists dispense "coal-tar creosote" when "creosote" is prescribed. The creosote of the U. S. Pharmacopœia is wood creosote, preferably that made from beechwood, while coal-tar creosote is a distinctly different substance and poisonous. The Board intends to proceed vigorously against these pharmacists for their criminal negligence.

Atropine in Intestinal Occlusion.—In the case reported by VOLTMAN (Roussky Vrach, Sept. 13, 1903) there was a sudden access of pain in the left lower abdominal region; this was followed by obstinate constipation and vomiting of green matter. Castor oil failed to move the bowels. The general condition not bad, pulse 92, temperature raised but slightly. Palpation causes pain; abdomen rigid to touch. Treatment—at first expectant—consisted of the administration of opium and pieces of ice internally. An enema on the sixth day produced no effect, except in the way of intensifying the pain to a very marked extent. A hypodermic injection of atropine, 1-40 of a grain, was then administered, followed in an hour by another of 1-30 gr., and in two hours by 1-20 gr. Pains better after the second, and entirely disappeared after the third injection, and the vomiting ceased; the bowels moved in a few hours; patient discharged convalescent on the next day. In the second case, that of a woman aged forty years, the symptoms of occlusion were signalized by severe pains, inflated abdomen, general malaise, constipation of ten days' duration, vomiting of green stuff, normal temperature, and pulse of 105; face characteristic; hiccough and belching. A hypodermic injection of 1-30 gr. of atropine eased the pain somewhat, but had no influence over any of the other symptoms; two injections of 1-20 gr. each failed of any result; meanwhile the general condition of the patient, as could be judged by the failing pulse, grew gradually worse, and a laparotomy was resorted to. The peritoneum contained a serous flaky fluid, the intestines were at certain spots markedly injected; at one spot there was considerable strangulation of the intestine which was freed without great difficulty. The condition of the patient became so alarming that the operation had to be discontinued, and patient died in one-half hour from cardiac paralysis. The reader is left to draw his deductions from the above cases as to the utility of atropine in intestinal occlusion.

Large Doses of Unguentum Hydrargyri.—Some seven or eight years ago Dr. Ivanoff recommended warmly large doses of mercurial ointment in post partum parametritis, and M. BIELOGLAZOFF (Prakt. Vrach, Sept 20, 1903) reports a few cases in which he obtained very favorable results from the drug. Of the cases reported we note one in which there was a parametritis after delivery; this was treated principally with vaginal balls of ten grains of mercurial ointment each and hot injections. As no results were obtained inunctions of two and three drams of the ointment were resorted to, increasing the dose to an ounce; as a result the exudate disappeared in a few days, and the patient left the hospital entirely recovered. During fifteen days of treatment 60.0 grm. of the ointment was used up. In another case the amount used up reached 75.0 grm. Among the conclusions we note as particularly interesting the one where the author ascribes to mercury the diminution of pain, and the absorption of the exudate. There were no mercurial after-symptoms of any kind observed in any of the patients. The whole matter is, however, as yet sub judice.

Lysoform.—Lysoform really seems to have properties which make it far superior to other disinfectants, according to B. GALLI-VALERIO (Therap. Monatsh., Sept., 1903). Nickeled instruments, even if kept for months in a three-per-cent. solution are not attacked. Used for the hands in 3- to 10-per-cent. solution, it deodorizes and renders the skin smooth. A 1- to 2-per-cent. solution is serviceable as mouthwash. Animal experiments show no or only slight toxic action. Feces and urine mixed with small quantities of the drug were still odorless after three months. Colon bacilli did not grow, even in weak dilution, and experimental peritonitis in guinea-pigs could be cured by intraperitoneal injections of a 2-per-cent. solution.

Glycosal in Rheumatism.—The properties of glycosal are praised by H. RATZ (Therap. Monatsh., Sept., 1903), since this drug, by virtue of its peculiar chemical composition, passes the stomach unchanged and liberates salicylic acid in the intestines, so that all gastric irritation is avoided. General and local symptoms disappear more readily than with aspirine but endocarditis cannot be prevented any more than with other salicylio acid compounds. After-symptoms were not observed except a slight pruritus and tinnitis aurium. Glycosal is also absorbed from the unbroken skin if alcohol, turpentine or some other volatile substance is added to the ointment.

Treatment of Dysentery.—A rapid, almost specific action is exerted upon pathological conditions of the intestines, such as are common in the tropics by a decoction of cortex granati, simarubæ and lignum campeche with the addition of some silver nitrate. L. KÖHLER (Therap. Monatsh., Sept., 1903) was able to cure almost hopeless cases with a tablespoonful of this mixture every twelve hours. The most delicate infants and patients with weak digestive organs experienced no nausea or untoward symptoms and amelioration already occurred in twelve hours.

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THE KAISER'S CASE.

WE have waited for more definite details as to the case of the Emperor of Germany before commenting upon it. The end of last week proved the advisability of such delay, since it brought the authentic report that while the growth in the Emperor's throat was spoken of originally as a polypus this was only a generic name loosely applied. It was not a true polypus in the sense of being properly pedunculated or having a true stem but was on the contrary of sessile character and its presence had brought considerable inflammation all over the vocal cord on which the polypus was situated.

This presents quite a different phase of the case from that which was apparently to be gathered from the original newspaper reports. Needless to say, a sessile polypoid tumor, with apparently a distinct tendency to infiltrate neighboring tissues, is much more dangerous as regards possible future malignant contingencies than would be a thoroughly pedunculated neoplasm affecting cells extraneous to itself only because of the irritation of its presence and the pressure of its growing tissue constituents.

The case has, of course, attracted widespread attention and has renewed the discussion of the subject whether cancer is hereditary or not. The Kaiser's father and mother both died of cancer and this would seem to add distinctly to the risk of any tumorous formation in his case proving eventually malignant. The whole question turns on the significance of heredity in such cases. There is no doubt that cancer seems to run in certain families and that in something over one-third of the cases that come under observation a family history of cancer in the more or less immediate ancestry can be traced, if the inquiry is only made with sufficient assiduity. There are those, however, who insist that notwithstanding this apparent etiological influence of heredity the question of inheritance is entirely due to coincidence rather than to any pathological tendency in the tissues.

At the present time, notwithstanding all the investigation of the etiology of cancer that has been undertaken in recent years, there is no generally accepted theory of causation. Prominent pathologists, who have made a specialty of the etiology of cancer, are prone at the present moment rather to accept one of the old theories of etiology in malignant disease than to concede that the affection is due, as many bacteriologists claim, to the presence of a parasite in the tissues. The most popular theory of cancer etiology remains that of the development of certain misplaced portions of tissue which were faultily included amid tissues more or less foreign to them during the process of embryonal development. Any injury in the neighborhood of these misplaced bits of tissue or any chronic irritation that weakens the resisting powers of neighboring cells may lead to the development of the cancer nodule to such a degree as to cause the death of the person in whom these embryonal tissue inclusions had been slumbering for many years.

It is easy to understand that this theory favors the influence of heredity as a factor in the causation of cancer. It is well known that tissue defects of various kinds run in families. Small tabs of tissue near the ears, for instance, are a characteristic family trait in many persons and may be traced for many generations. Other family birthmarks of many kinds, but all of them due to redundancies of tissues, are so common as no longer to attract much attention. They are considered to be family traits and no further thought is given them by the observer. They are really the best possible evidence for the inheritance of such tissue anomalies as might give rise to cancer and for cancerous family heredity.

The attack in the case of Emperor William is by no means encouraging, as the bulletins of his specialist attendants seem to indicate. Prof. Orth's pathological findings with regard to the material removed fail utterly to have weight in the case when we recall that on three different occasions the late Prof. Virchow examined portions of the tumor from Kaiser Frederick's larynx, yet failed to find any evidence of malignancy at a time when the clinical diagnosis of malignant disease was already settled in the minds of the German medical attendants.

The whole case is only another lesson in our lack of definite knowledge with regard to cancer and the consequent necessity for the greatest care in the prognosis of these borderland affections which, in tissues liable to frequent irritation in the exercise of normal functions, as is surely the case in Emperor William's larynx, may well take on malignancy in spite of every precaution in the treatment of an originally benign neoplastic process.

THE PRACTICAL ELIMINATION OF YELLOW FEVER.

IT has, it seems, been long a mooted proposition among scientific observers, particularly with those who labor in the fields of the Spanish possessions, as to which class of the Latin colonial races can be regarded anthropologically, as the "fittest." This vexed question now appers to have been definitely answered by the inhabitants of Protera, in Mexico, who have, it is reported, decreed that the only survivors shall be those who are untainted by yellow fever. The alcalde and council have sustained their action, and orders have been issued that all sufferers of the disease shall be promptly poisoned as soon as the symptoms can be identified or the diagnosis be made beyond a reasonable doubt.

As is now well known, a serious yellow fever epidemic has been raging along the Rio Grande for some weeks past, and the cases have run up into the thousands, while the death rate, as could only be expected among such unhygienic surroundings, has been appalling. In the face of such a condition of affairs it became apparent—even to the Mexican mind, which, like the Mexican cayuse, seldom stands without hitching—that "something must be done." They were perfectly willing to admit that the mosquito carried the germs of the infection, and thus spread the epidemic, but they were naturally much more interested in the "stamping out" of the disease itself than they were in the theory of its etiology. Gauze nets did not a prison make, at Laredo, nor mosquito bars a cage at Monterey. Dr. Stiles had not succeeded in breeding his *Stegomyia fasciata* destroying parasites, as duly scheduled in the daily newspapers, with a photographic attachment, and it was more than evident to the *Ayuntamiento,* or "selectmen" of this Mexican township that if any result was to be attained some other means certainly must be employed.

That this method of suppressing the ravages and spread of the disease is somewhat drastic is true, but can it be denied that it would be thorough? Is there any logical doubt but that it would prove effectual? Thus we know that the mosquito is the principal, if not, as claimed, the only vehicle, for the transmission of the disease, for we have been taught that if an insect of the proper species bites a patient suffering from the malady and subsequently stings a perfectly healthy individual, that he will, in turn, be inoculated, and that the fever will thus spread and be carried from person to person and from town to town.

It is proverbially a poor rule that will not work both ways, and all equations have two sides. If the mountain could not be brought to Mahomet, and if the mosquito vehicle could not be eliminated, why not take the founder of Islam to the hillside and kill the patient as soon as the symptoms are developed, and thus destroy the focus of infection? Dead and buried, they could not furnish food for the net-evading mosquitoes, and the epidemic would terminate, from the want of fresh inoculating centers. Men have died and worms have eaten them, but there are no reported cases of the ubiquitous mosquito having penetrated six feet of earth.

As to the City Fathers of Protera, to them we make our bow. The blue ribbon of originality should mingle with their civic ermine, and their reasoning is sound, even if hardly practicable in other communities that cannot boast of such an ancient civilization. We must remember, too, in their defense, that even if their promulgations strike us as a little arbitrary, that they are surrounded by their friends and immediate relations, and that they are doubtless actuated, in a Spanish way, by the belief that they are not only doing the greatest good to the greatest number, but that from previous experience they have every reason to believe that the poison which they are to administer is no quicker in ac-

tion, or more certain in results, than the fever that they are fighting.

We must, however, admit that they are doubtless tinged with a certain local coloring, and are imbued with an exaggerated idea of the value of the lives that they are seeking to preserve. For the ordinary American cowboy, who has been brought in contact with the lower Mexican classes, seems possessed of a fixed and firm belief, which he is prepared to argue, even at the pistol's point, that the intrinsic worth of a dead "Greaser" is as a hundred to one of the live article; and that a race, whose sole virtue—early rising—is simply the fruit of a desire to have more time in which to loaf, can hardly spend its leisure better than in the convalescence of a tedious and lingering disease.

But, be this as it may, the scheme strikes us as not only novel, but efficacious, and as it originated in Mexico, we should advise that the experiment be made there during the present epidemic, as they suggest—that the drugs employed should be imported, and that they should be administered on a holiday, to avoid delay, and to prevent such a meritorious plan from being forever lost in the national *mañana* of the country.

EXPERIMENTAL BIOLOGY AND MEDICINE.

FEW medical societies are able to present a set of proceedings containing so much interesting and suggestive material as is to be obtained in the brief account of the last meeting of the New York Society for Experimental Biology and Medicine, which will be found on page 957 of the last issue of the MEDICAL NEWS (Nov. 14). There is just that combination of the original in biological science with possibilities of direct medical application that is sure to make valuable working material when the principles experimentally discovered are tested by actual practice. Dr. Park's article on the occasional presence in the blood of untreated adult animals of large amounts of substances agglutinating many bacteria gives an excellent idea of how much wider than is ordinarily supposed is the problem of agglutination and its significance. Agglutination is probably connected with immunity and the subject of natural immunity is one of the most interesting in the whole domain of medicine. Just why some people contract certain diseases while others apparently of similar constitution and without any known artificial protection remain refractory is one of the mysteries that modern pathologists are more interested in solving than almost any other of the obscure problems which come up for their consideration. It is very clear that this natural agglutination described by Dr. Park is going to be the source of many errors and a number of false hopes unless the greatest care is exercised in precautions against possible error before definite announcements of results are made. It would seem that even such excellent authorities as Shiga, the discoverer of the bacillus of dysentery, and our own Flexner were led into error because of this hitherto unconsidered factor in the problems they were working out. Duval and Bassett, who announced that they had found the dysentery bacillus in a number of cases of cholera infantum a little over a year ago, were certainly misled to false conclusions, and their mistake is due to the assumed principle that the existence of agglutinating powers in the blood serum of certain patients was the proof of the fact that they were being affected by certain forms of bacteria. It is interesting to find that young animals have very few agglutinins in their blood, and that therefore probably the same thing will hold true for young children. It is possible that the first agglutinating powers obtained by the child's blood are derived from its mother's milk, and are possibly due to the fact that this fluid has been influenced by the immunity to certain diseases produced by attacks of these specific diseases during the mother's previous life.

Dr. Calkins' discussion of the smallpox organism seems to demonstrate that the appearances observed in smallpox cases are those of a protozoan parasite, since the different stages of the organism have been definitely recognized by him. A very interesting side-light on smallpox is thrown by the demonstration of a corresponding parasite in certain forms of *Paramœcium*. This is a very common lower organism which exists in abundance in pools and swamps, and may even be found under certain circumstances in ordinary drinking water, and it is not impossible that it may prove to be the host of the smallpox organism outside of the human body. Now that the secondary hosts for malaria and yellow fever have been demonstrated, it may be expected that further such important steps in biology will be made with quite as beneficial effects in practical medicine. If this special bit of progress should come for smallpox next it would indeed be an important advance for sanitary science and prove of the greatest possible benefit to the race.

Dr. Meltzer's demonstration of the effect of ligature upon the circulation in sciatic nerves is an eminently practical demonstration of the influence of the peripheral circulation on the nervous system. When a single ligature is applied to the sciatic nerve and methylene blue is injected intravenously into the animal, the nerve becomes completely stained, just as if there were no ligature. When two ligatures are applied, however, some distance apart then the portion between the ligatures does not become stained blue, though the peripheral portion of the nerve beyond the external ligature and the proximal portion inside of the internal ligature do become colored. It is evident, then, that a considerable part of the circulation of nerves is derived from the periphery of the body. No matter how distant from one another ligatures are applied along the trunk of a nerve like the sciatic, no staining is found between the ligatures. Therefore, when any pathological condition causes a lessening of the circulation in the skin and outlying portions of the body, nervous nutrition must suffer. This explains why hydrotherapy, massage, gentle friction of any kind, and even the application of mild counterirritants is effective in producing distinct changes for the better in the peripheral nervous system.

We have selected for comment only certain of the articles under discussion before the Society, because they seemed of specially suggestive value. The whole proceedings, however, will be found of great interest. There is no doubt that this class of work and the combined investigations of biologists, experimental and medical observers will do much to bring up the standard of medical originality here in America and will also serve to redeem much of our medical society proceedings from the aspersions sometimes cast upon them of seldom containing original material of any value and of usually consisting of scarcely more than a farrago of things already long known and sometimes even long since unlearned.

THE CANCER PROBLEM.

THE etiology and cure of cancer has occupied the minds of men and stimulated the research from the very dawn of medicine and to-day there is hardly a large laboratory, here or abroad, where diligent study is not directed to this most difficult of problems. It is to be regretted that with so enormous a literature—Behla has collected several thousand references up to 1901—such a discordance of opinions should still exist among the foremost pathologists.

Nevertheless much has been done to cure cancer. Operations have been so perfected—we refer only to the Wertheim method of hysterectomy—that many a patient remains free from recurrence for the rest of his life. With better education of the laity and keener diagnosis on the part of the physician, the disease is recognized earlier and hence the outlook in general is more favorable. Superficial cancers have even been cured without the knife, by such agencies as liquid air and arsenic, and, more recently, with Roentgen and radium rays. But the fact still remains that most internal cancers are hopeless and that the surgeon often operates only with the hope at best, of prolonging life for a few months.

In glancing over the more recent literature, one receives the impression that the parasitic theory of cancer is on the wane. The laity is somewhat late to discover what physicians have already discarded, hence it does not seem strange that the city council of Vienna recently recommended an exhaustive trial of cancroin in the hospitals. It will be remembered that cancroin was obtained directly from the cancer cells by Adamkiewicz, whose methods of bringing his discovery before the public were neither ethical nor convincing. Yet the idea does not seem altogether phantastical that in cancer the epithelial cell no longer works in unison with the other cells for the benefit of the entire body but solely for its own good, thus assuming the rôle of a parasite which when injected in attenuated doses may inhibit the growth of similarly abnormal cells in the body.

This theory has, however, met the same fate as the brilliant work of v. Leyden, the diligent research of Plimmer, Sanfelice and our own Gaylord, and the painstaking studies of Feinberg, who has devoted an entire volume to the finer structures of the protozoa and has demonstrated their close resemblance to the cell-inclusions of cancer. For every convincing article, a second one appears which points out some flaw in the observations. Recently T. Honda (*Virchow's Archiv*, Vol. 174, No. 1) has found the inclusions not only in glandular carcinomata but also in a number of other tumors and inflammatory processes, so that they can hardly be looked upon as specific.

Doubtless the real cause of cancer is not always the same. In certain organs, as in the uterus, the various transition stages between chronic inflammation, benign adenoma and malignant carcinoma are often so apparent, that the whole seems to

form one continuous process. It seems very probable that malignancy here is merely the end result of chronic irritation and inflammation. But there still remains a large number of cases in which the connection is not so clear and with a better knowledge of the life history of protozoa and with means to grow them outside of the body the mysterious hyaline bodies may still play a prominent part in pathology. Let us hope, then, that a satisfactory therapy may be not so far off.

ECHOES AND NEWS.

NEW YORK.

Trustees of Hospital Association Meet.—A meeting of the Board of Trustees of the Hospital Saturday and Sunday Association was held last week at the United Charities building. The application of St. Andrew's Convalescent Hospital for admission to the Association received favorable action. This brings the membership up to forty. The New York Hospital formally waived its privilege to receive a share of the annual collection. The general agent reported on the prospects of the coming collection, and ways and means for promoting it were discussed. The last collection resulted in a total of $83,500, a considerable increase over any previous year. The necessity for promoting a greater public interest in hospital support to meet the ever-increasing demand for free work was urgently presented by the representatives of various institutions.

Meeting of Hospital Guild.—The Hospital Guild of New York Hospital for Women held last evening its first meeting of the season. Reports were received from the committees which had continued work during the summer. Several physicians spoke of the standard of excellence preserved at the institution in One Hundred and First street. The hospital, however, has become overcrowded, and the Guild has decided to devote most of its energy this winter to raising a fund to start a new ward for children exclusively.

Bellevue's New Dispensary.—The old building formerly used as the Bellevue Medical College was thrown open this week, and will be known hereafter as the Dispensary for the Outdoor Patients. The structure has been renovated and made fireproof at a cost of $53,000. The first floor of the present dispensary building will be used for the dispensary proper and the bookkeeping department, while the remaining three floors are to be used as sleeping apartments for the female employes of the hospital, who heretofore have been forced to sleep in the basement of the hospital buildings.

Choice of Hospital Site Delayed.—There seems to be another hitch over the selection of the "site for a State hospital for the insane at some place in the counties in the northeastern part of the State, north of the County of Rensselaer." As Washington County is the only county between Rensselaer County and the boundary line of Vermont State, sites in no other county have been considered. The act providing for the selection of the site and the expenditure of $50,000 for land and necessary expenses of the commission, in preparing plans by the State architect, for expert engineers, etc., makes this condition: "Such site shall be so located as to be easily approached by railroad and other means of communication." Originally the committee of the State Lunacy Commission considered nine sites. The number has finally been sifted down to four, known as the Greenwich, the Cambridge, the Whitehall, and the Comstocks. Each contains the requisite 1,000 acres, and the committee says any one meets all the requirements. The members of the committee assert that the lucky site will win out on its merits, but there are others who believe that the much-agitated Republican politics of Washington will figure in the selection. In order to ward off suspicion of political maneuvers the committee decided to employ an expert engineer from Cornell University, but later reconsidered its determination. Of the four sites, it is intimated that the Comstock land has the preference with a majority of the committee.

Railway Surgeons' Convention.—The thirteenth annual convention of the New York State Association of Railway Surgeons was held last week at the New York Academy of Medicine, 21 West Forty-third street, with Dr. Henry Flood of Elmira, President of the Association, as Chairman. Dr. James A. Exton, of Arlington, N. J., discussed "Car Sanitation." Dr. C. B. Herrick, of Troy, N. Y., read a paper on the diagnosing of injuries to the head. Dr. Wisner R. Townsend, of this city, talking about "The Diagnosis of Injuries of the Hip," recommended that in diagnoses in children's cases the X-ray be used. Dr. Walter Lathrop, of Hazleton, Pa., sent a paper on "Modern Treatment of Wounds." In a paper by Dr. W. B. Coley, of this city, on "Traumatism as a Factor in the Causation of Hernia," the doctor said that his experience at the Hospital for the Ruptured and Crippled had shown that in only four cases out of 15,000 had hernia resulted from external accident. Dr. A. J. Gilbert declared that hernia had cost the railroad companies more money than any other cause of injury, and that it is a "frightful source of fraud, particularly among employes." The following officers were elected: President, C. G. J. Finn, Hempstead, L. I.; Vice-President, Dr. G. T. Conn, Concord, N. H.; Secretary, Dr. George Chaffee, Brooklyn, re-elected; Treasurer, Dr. J. K. Stockwell, Oswego.

Test for Diphtheria Antitoxin at Elmira.—Many new facts are likely to be brought out by the use of antitoxin in the rather severe epidemic of diphtheria now going on in the State Reformatory at Elmira. Over 50 cases have developed, including the assistant resident physician, and three deaths are reported up to the present time of writing. The entire supply of antitoxin in the city was bought up and appeals were made to the State. A supply of 1,500,000 units was received from the State Laboratory and every inmate in the reformatory inoculated. Resident Physician Christian and Dr. Frank W. Robertson, the Superintendent, have declared the epidemic completely and suddenly checked. Dr. Robertson said that antitoxin had made all inmates not already infected with the disease immune, and that the epidemic was completely under control, due to the antitoxin. All State medical societies have asked for a complete history of the cases, and it is likely that the results at the reformatory will figure in future literature relating to antitoxin.

The New York Medical Gymnastic and Massage Society.—This Society announces that after November 15 a clinic will be in operation under its auspices for medical gymnastic or massage treatment. Physicians often have patients of limited means for whom they would like to prescribe this treatment, were the expense not prohibitive. The proposed clinic will be a beginning in making a provision for the needs of

this class. Suitable rooms have been secured on the first floor at 210 East Forty-first street. Treatments will be given daily from 11 A.M. until 3 P.M., Saturdays and Sundays excepted, under the supervision of an Official Staff appointed by the Society. The treatments will be given by members of the Society, a sufficient number of whom will be present at each clinic hour. The same members are present at the same hour each day, so every patient will be treated throughout by the member to whom his case is at first assigned. Should any physician desire to put a patient under the charge of any particular member of the Society, an effort will be made to so arrange it, the member's time permitting. In order to provide for the maintenance of the clinic, in its essential expenses, patients will be charged an amount ranging from 25 cents minimum, to 75 cents maximum per treatment, according to their ability to pay. No free treatments will be given at the beginning unless by a vote of the Official Staff. The Society and its members give their efforts and time without remuneration. All receipts, either in fees or contributions, which may at any time exceed the amount necessary for the running expenses, will be devoted to increasing the facilities for work.

Three New Water Sources for City.—Three new sources of supply for increased water service for the city, each separate and distinct from the other, will be recommended within the next two weeks by the special commission appointed several months ago by Mayor Low to investigate the matter. The report was to have been submitted to Mayor Low Tuesday, but owing to the exhaustive investigation which the three Commissioners, Professor William H. Burr, Rudolph Hering and John R. Freeman, have made it has been impossible to complete it on time.

The commission will recommend that the city first acquire additional watersheds on the east side of the Hudson river, on the Upper Fishkill and Clinton Hollow, on the Upper Wappinger, in Dutchess county, establish a chain of enormous reservoirs, several of which will be much larger than the new Croton reservoir, and all to be connected by a line of aqueduct more than eighty miles in length. The commission will point out that by taking up this part of the work first the city will save the delay necessary to dig tunnels under the Hudson and bring water from the Catskill watershed. As soon as this work is under way the commission urges that the city should begin the purchase of property in the Ramapo region to get control of that watershed. The principal dam, they point out, should be built in the vicinity of Bishop's Falls, on the Esopus River, where it has been found that a dam of much greater height than has heretofore been deemed advisable may be constructed. This, the commission says, will make it possible to flood an area of more than fourteen square miles and provide a storage reservoir of more than double the size of the new Croton reservoir. In addition to this dam five others are recommended—viz., at Cold Brook, Lake Hill, Wittenburg, Shandaken and Big Indian. All of these are on the southern and eastern slopes of the Catskills. The commission proposes also to utilize the watersheds on the opposite side of the mountains and to turn the water into the Esopus by means of a tunnel thirteen miles in length, crossing under the Catskills from the Schoharie watersheds. Four sites for large storage reservoirs in the upper Schoharie watersheds have been located, so that this system will have a total of ten reservoirs large enough to hold in reserve the great supply of water which that region contains. Part of this supply will be utilized for Richmond Borough by extending the pipe lines through Jersey around by way of Paterson beneath the Kill von Kull. The third step to be recommended for bringing the supply up to the demand of the future New York is a filtration system in Dutchess county to purify the water of the Hudson river. A system capable of filtering fifty million gallons of water a day at the outset and so arranged that it may be increased from time to time is proposed. The entire report, covering all the details brought out by the extensive surveys and the thousands of borings made by the engineers sent out by the commission, and the estimated cost of the work, is to be sent to Mayor Low about December 1. It is now being printed, together with the maps and diagrams showing what work is necessary and just where each reservoir and pipe line is to be located. The completion of the first section of the work alone will require many years. After approval the scheme will undoubtedly be carried out under the direction of the Aqueduct Commission.

Mortality Rates in New York.—"A study of the ratio of deaths to population in this city by John F. Roche, made primarily for the life insurance companies," says the *Tribune*, "brings out a number of facts with which the general public is probably not well acquainted. To serve the special purposes he had in view his inquiry related to the bearing of sex and age, rather than that of disease, on length of life. In all respects the metropolis would not represent the country at large. The paper now reprinted from the 'Transactions of the Actuarial Society of America' was based on the census of 1890, and not that of 1900. Moreover, Mr. Roche refrains from philosophizing over the facts presented. None of these considerations, however, materially lessen the interest which attaches to his analysis. Possibly the most curious and novel feature of his statistics is the way in which first one sex and then the other exhibits superior vitality. Although a larger number of boys than girls are born here, the former appear to succumb more readily than the latter to the diseases and accidents of infancy and early childhood. At the age of seven Mr. Roche's tables indicate that a numerical advantage of about 1,000 in births has been wiped out, and thenceforward what has been regarded as the more tender sex continues to make the better showing for more than twenty years. Thereafter the pendulum makes two oscillations. Between the ages of twenty-nine and fifty-six men are—or were in 1890—more numerous than women. From that point onward the latter are again in the ascendancy. When the Eleventh Census was taken there were in this city 1,680 men who were seventy-five years old, and 2,120 women. For persons eighty-five years old or more the figures were respectively 291 and 518. The greater endurance in infancy and old age here revealed more than compensated for the higher mortality of women in middle life. The net result may be put in this fashion: Out of a population of about 3,500,000 there were at least 25,000 more girls and women than boys and men, and yet there were 5,000 fewer deaths among the former than among the latter. From this state of things Mr. Roche estimates that at the time of birth in this city the 'natural expectation of life' for a boy is thirty-nine years and for a girl forty-three. That an enormous proportion of children die before reaching the age of one full year is only too well known. It amounted to over 18 per cent. in 1890, or one death for between five and six births. A less familiar fact is the stage at which the minimum mortality occurs. The rate falls off rapidly with both

boys and girls from infancy to the age of eleven, when it is only one in about 440. Thereafter there is a steady increase. It slightly exceeds 1 per cent. at thirty, and 8 per cent. at three-score years and ten. About 20 per cent. of the women who attain the age of eighty-five, and 25 per cent. of the men, drop off inside of the next twelve months. Mr. Roche was able to make no comparison with the mortality of earlier years, but there is ample evidence from other sources that the average length of life in the United States has increased in the last quarter of a century. This results mainly from the adoption of sanitary precautions in large cities and from a better understanding of the nature of disease. Still greater progress, though, may be expected in coming years. Mr. Roche bases some of his hopes for the future in the metropolis on the filtration of water here. No doubt that will come in time, even if the death rate from typhoid fever remains as small as it is now. However, the greatest scourge is tuberculosis, which in 1900 caused 13.6 per cent. of the mortality in the metropolis. When the ignorant classes understand as well as do educated people what measures should be adopted to prevent infection with this disease a wonderful diminution of harm from it will result."

PHILADELPHIA.

Aged Negress.—Mary McDonald, a negress, celebrated her 133d birthday recently at the Home for Aged and Infirm Colored Persons. She did not know it was her birthday until she was congratulated by the matron and then said she did not wish to live much longer as she was too much bother to those around her.

Honor for Dr. Kirk.—The Dean of the dental department of the University of Pennsylvania, Dr. Edward C. Kirk, has just been notified that to him has been awarded the silver medal for the current year which the "Societe d'Odontologie de Paris" awards every year to the author of the best works published during the previous five years. The letter of notification from the Secretary of the Society closed as follows: "We desire to add to the good news herewith conveyed our heartfelt congratulations, and we further wish to inform you that the announcement to the Society of this just award was enthusiastically received."

Judge Determines Physician's Charges.—Judge Penrose, in the Orphans' Court recently, gave his views on physicians' charges when dealing with the estate of a spinster, who died in Atlantic City in 1902. He found a balance of $10,959.95 for distribution. One physician asked $350 for medical services, $400 for surgical services and $45 interest—$795 in all. "The claimant," said Judge Penrose, "was examined without objection to his competency. He testified that his practice was to charge from $3 to $5 a visit, the latter being the rate 'for people in good circumstances stopping at the better class hotels.' While the custom to charge persons supposed to have large means at a higher rate than the ordinary commercial value would not be illegal, in the opinion of the auditing judge the rate to be allowed for the day visits cannot exceed $3." This physician was allowed $434 for his services. A prominent surgeon who did a brain operation on the patient and charged $450 when he should have charged $1,000, was awarded $200 by the judge.

Women's Medical College.—A certain amount of discord is said to prevail between the above institution and the Women's Hospital which adjoins it and is used for the teaching purposes of the college. Although thus far the controversy between the two institutions has not been carried to the point where diplomatic relations are severed, it is feared that the latest move of the authorities of the college will make out-and-out strife inevitable. This comprises a proposition to build on the lot of land that separates the institutions a new hospital, to be under the control of the college. For this purpose the alumnæ have been asked to subscribe to a fund of $500,000. Friction between the two institutions started with an attempt on the part of the college to inaugurate an innovation, which, it was held, would destroy the identity of the hospital, lessen its usefulness and virtually make it an adjunct to its sister institution. A proposition was made that the various professors of the college be placed at the heads of their respective departments in the hospital. This arrangement was effective for a time but was finally discountenanced by the hospital authorities.

X-ray and Finsen Light Treatment.—The meeting of the Philadelphia County Medical Society November 11 was devoted entirely to the consideration of the above topics. Dr. M. K. Kassabian spoke on the Technic of X-ray Treatment. He exhibited cuts of a table which he has had devised for the Philadelphia Hospital. One advantage is that the patient can be treated from beneath as well as from above. Another feature is the diaphragm which is a sliding variety instead of an iris, as is usually employed. This table is so constructed as to protect both patient and operator. A mirror is so arranged that by looking into it the operator can watch the tube, regulate the light and observe the target without looking at the tube and thus affecting the eyes.

Dr. G. E. Pfahler reported very encouraging results in the treatment of carcinoma and tuberculosis. An interesting case was that of a retrobulbar sarcoma cured without affecting the eyesight. Dr. Pfahler finds that the more lesions have been tampered with before X-ray treatment has been begun the less likely are results to be secured.

Dr. W. M. Sweet, in discussing X-ray treatment of the eye and its appendages said that in epithelioma of the eyelid the older plastic operations were not now warranted since the X-ray was available. He has treated 30 cases with good results in all but two.

Dr. H. K. Pancoast, in the treatment of keloid by the X-ray, has found these growths amenable, but they require long and tedious efforts.

Finsen Light and X-ray in the Treatment of Diseases of the Skin.—Dr. J. F. Schamberg said that the use at the Philadelphia Polyclinic of the simplified lamp had not given results that made them at all enthusiastic. He believes that better results should have been attained by the 200 treatments in some cases. The simplified lamp does not penetrate sufficiently for deep lesions for which the Finsen lamp is necessary. As compared with X-rays these lamps are perhaps more useful in cases of lupus erythematosus. In lupus vulgaris the X-ray is better. In ulcerated areas due to lupus vulgaris the light treatment and the X-ray should be conjoined. The X-ray is better for mucous membranes and ulcerated areas and concentrated light for the skin.

The Cause of the Typhoid Epidemic.—Notes have recently been given regarding the belief of the officials that milk instead of water was responsible for the continued presence of typhoid in this city. Further investigations regarding recent outbreaks are in progress. As to their results up to the present Dr. A. C. Abbott says: "Between October 19 and November 12, inclusive, 55 cases of typhoid fever were reported from the Twenty-sixth and Thirty-sixth wards. Of this number 35 obtained their milk from

a single dealer. On investigation it was learned that between September 24 and October 5 and between October 5 and October 29 there had been two cases of sickness in the house of the dealer. These cases are represented to the Bureau as fevers—to be precise, as bilious remittent fevers—with some symptoms suggestive of typhoid fever, but not enough to justify a positive diagnosis and not enough to warrant their being reported as cases of typhoid fever. However, the Bureau decided to give the public the benefit of the doubt, and in consequence forbade the further sale of milk from the suspected premises. The house, the milk shop, and all utensils used in the business have been thoroughly disinfected. Had the Bureau received full information as to the possible nature of these cases at the time of their occurrence, much suffering might have been prevented. While it is dangerous to predict results, it is nevertheless the belief of the Bureau that an important factor concerned in the causation of a large number of the cases in the Twenty-sixth and Thirty-sixth wards has been discovered and eliminated. We regard the foregoing experiences as important arguments in favor of the position taken by the Bureau—namely, that too much attention cannot be paid to the sanitary conditions under which milk is supplied to the citizens."

Medical Jurisprudence Society.—On Monday evening, November 16, the Medical Jurisprudence Society of Philadelphia, after several years of inactivity, resumed its meetings, with Dr. Henry Leffmann, Secretary pro tem in the chair. Dr. Solomon Solis Cohen read a paper on "Judicial Determination of the Cause of Death." Dr. Cohen severely criticised the present system and considered the Massachusetts system, although by no means ideal, still an advance. He recommended a plan of which the following is a brief summary: (1) The cause of death to be determined by a jury of experts, consisting of a pathologist, bacteriologist, chemist, medical or surgical practitioner of admitted ability, neurologist, etc. (2) This jury, sitting in open court, be empowered to review the post-mortem, chemical, bacteriological and other examinations, hear testimony bearing upon the symptoms preceding and leading to death, review any evidence bearing upon the cause of death, and submit an opinion or opinions as to cause of death formulated in the shape of a report, or majority and minority reports, for the consideration of the lay petit jury before which the case will be tried. The paper was followed by an interesting discussion in which the lawyers very clearly indicated that Dr. Cohen's plan was not feasible under existing conditions, and the medical men present expressed the belief that it is doubtful whether a jury could be secured that would submit an unanimous opinion, and one lawyer believed that if such an opinion were submitted no jury would believe that it had been reached by legitimate and trustworthy methods. The Society will meet about four times yearly; the next meeting will be January 18, 1904, at which time permanent officers will be elected.

Medical Inspection of Schools.—A meeting of persons interested in this subject is to be held in Philadelphia, December 3, at 8 P.M., the place to be announced later in the daily papers. The meeting is for the purpose of aiding the plan of the Department of Health and Charities to institute a service of Medical Inspection of Schools, with School Nurses, in this city. The main address will be delivered by Dr. Ernst J. Lederle, Commissioner of Health, of New York City, who will be followed by the Supervising School Nurse of New York City, Miss Lina L. Rogers. The Mayor has consented to preside, and the President of our Board of Public Education will also speak. A discussion will follow these speakers.

CHICAGO.

Children's Hospital Commission Makes Report of Deeds and Needs.—Four months of philanthropic endeavor on the part of the Milk Commission of the Children's Hospital Society has reduced the death rate among infants and raised the standard of milk supplied to the homes of many thousands of both rich and poor. The Commission has given out the statement of its work and of its needs for the future. The funds it has on hand will keep it going until January. After that financial support must be forthcoming, but while this fact is set forth, no appeal for funds is made. The Commission prefers that its deeds should speak for it and determine to the public whether it is deserving of aid. Cases of poisoning of children by milk that was not fresh have been reported, and the blame is laid to the new rule of the Milk Wagon Drivers' Union, requiring but one delivery a day instead of two, as formerly. The drivers say, however, that under the old system the second delivery was old milk, shipped into the city at the same time as the first delivery. The Commission and the Union will now cooperate in an effort to obtain better transportation facilities, so that two daily deliveries may be had.

Praise from Dr. Reynolds.—Praise of the Commission's work comes from the Health Department. A letter from Commissioner Reynolds is made a part of the report, saying: "During the summer season there were 2,385 deaths of children under five years of age. This is at the rate of 12.6 per 10,000 of the total population. In the summer season of 1902 the proportion of such deaths was 13.3 and in that of 1901 it was 14.3. The reduction this year is especially significant in view of what was anticipated as a result of the one daily delivery plan. Children's physicians and sanitariums were gravely apprehensive of a murderous increase in child mortality through feeding of milk from forty-eight to sixty hours old. Fortunately this apprehension was not realized, chiefly, as I am firmly convinced, through the distribution of 190,000 bottles of sterilized milk by your commission."

Children's Hospital Society.—The organization of the Children's Hospital Society early last spring by the reform department of the Chicago Woman's Club is related, and then the creation of the Milk Commission, resulting from the discovery that out of 27 institutions visited by the Hospital Committee, not one was able to furnish its patients with milk of the desired standard. The Executive Committee of the Milk Commission is headed by E. P. Bicknell; Mrs. Geo. M. Moulton is Vice-Chairman, Mrs. Geo. W. Plummer, Secretary; Dr. A. B. Keyes, Auditor; and the other members are Drs. I. A. Abt and J. C. Cook. Dr. Frank Billings is the President of the Commission, and Mrs. Harold McCormick is Secretary.

Toy Pistol Ordinance.—The City Council passed a toy pistol ordinance Nov. 9, which prohibits the sale, loan or furnishing of toy pistols, guns, etc., to minors, and fixing a $100 fine for each offense.

Muzzling of Dogs.—The Chicago Medical Society, October 28, endorsed the ordinance now before the Council requiring the muzzling of dogs during the entire year. A committee was appointed to attend the Council and urge the passage of the ordinance.

The Work of the Milk Commission.—Mrs. Mary R. Plummer gave an outline of the work that this

Commission is doing before the Chicago Medical Society, Nov. 11, 1903. She referred to certified and inspected grades of milk, saying that there is no compulsory examination of cows unless there is complaint. Farmers who desire to furnish pure milk to the community do not object to having their cows and dairies inspected. She mentioned five farms which are under the inspection of the Commission. These farms furnish either certified or inspected milk. The inspectors of the Commission make periodical inspections and examinations of the dairies and cows of these farms, and if any one farm is not up to the standard exacted by the Commission, the inspector offers suggestions for improvement. Before milking the udders are wiped off, the milkman is compelled to have his hands thoroughly clean; the milk pail is thoroughly cleaned, and the first milk is discarded, because it is thought bacteria gather in it.

The Relative Importance to the Community of Pneumonia and Tuberculosis.—Dr. Arnold C. Klebs read a paper on this subject before the Chicago Medical Society, November 11, in which he drew the following conclusions: (1) That the relative economic importance of pneumonia and tuberculosis cannot be estimated by a mere comparison of total mortality figures for each disease. (2) That the high mortality figure and its increase of late, for pneumonia is produced by the enormous death-rate and its increase, attributed to this disease, in early childhood. (3) That, therefore, the high mortality from pneumonia and to a certain extent its increase is due to a classification of different ill-defined pathologic conditions under one name, while that from tuberculosis represents that of a well-defined morbid entity. (4) That for this reason and on account of the relative shortness of disabling sickness and frequent recovery in pneumonia, the great length of disabling sickness and infrequent recovery in tuberculosis, the relative importance of the two diseases is so vastly different, that a comparison on economic grounds reveals the overpowering danger from tuberculosis. (5) That the steady decrease of the tuberculosis death-rate can be explained on the grounds of increasing improvement of hygienic conditions in late years and as the result of specific prophylactic measures. (6) That the increase of the pneumonia death-rate occurring in a time of improving hygienic and sanitary conditions and of a general application of antiseptic principles, shows its independence of these features. (7) That, therefore, and in view of the still enormous mortality from tuberculosis, its demonstrated preventability and the possibility of its arrest only in its earliest stages, the institution of educational measures in regard to personal and public hygiene widely and specifically applied, for the prevention of this disease, seems to be distinctly indicated. (8) That since for pneumonia, as pointed out by E. F. Wells, "the fundamental information on which prophylactic rules may be formulated is not yet at hand" this subject needs further investigation from a bacteriological and epidemiological standpoint as well, before "exaggerated and irrational notions in regard to its dangers and its avoidance" are communicated to the public, which in view of the facts given are out of all proportion.

CANADA.

Appointments.—Dr. J. C. Mitchell, assistant physician at the Toronto Asylum for the Insane, has been appointed by the Ontario Government medical superintendent of the new Epileptic Hospital now in course of erection at Woodstock, Ontario. Dr. Mitchell is popular with the Ontario medical profession having been last year President of the Ontario Medical Association. He has been granted four months' leave of absence to visit similar institutions in the United States and Great Britain. Dr. M. O. Klotz of Ottawa, has been nominated by the Faculty of Medicine of McGill University for the appointment as Governor's Fellow in Pathology. Dr. Klotz is a graduate of Toronto University, and for some time past has been conducting experiments in bacteriology at the Ottawa Isolation Hospital. The appointment will be officially made at the next meeting of the Board of Governors.

Montreal General Hospital.—The following is the report of the Montreal General Hospital for the month of October: There were 250 admissions to the wards; 220 discharged; 12 deaths. In the outdoor departments there were 2,532 consultations, the largest number for any one day being 200. The number of ambulance calls for the month was 124. The typhoid fever cases have decreased to 24.

Toronto's Fine and Excellent Water.—That Toronto as a city has the purest supply of water of any city on the American continent is evidenced in the reports of the Medical Health Department on analyses made since July 11 last. On that date an analysis showed that there were 300 colonies per c.c. Most of the examinations made between that date and November 3 registered lower than 500. Only once did an examination register over 1,000. Ten years ago it was a common thing to have 20,000 colonies of bacteria per centimeter. The change is due no doubt to a new steel conduit and a new settling basin.

Ottawa Medico-chirurgical Society.—This society, which is the result of the amalgamation of the two old medical societies of Ottawa, held its first regular meeting on the evening of November 5, when the president, Dr. H. B. Small, delivered the first presidential address under the new order of things medically at the Capital. His address, which was very highly appreciated, referred to earlier medical history of the Capital, or Bytown, as it was formerly called. The society will meet the first and third Thursdays of each month. Sir James Grant, M.D., is the Hon. President; Dr. H. Beaumont Small, President, and Dr. C. H. Brown, Secretary.

British Columbia Marine Hospital.—Complaints have recently been made with regard to the condition of the Marine Hospital at Victoria, B. C., a hospital which by the terms of federation with the Dominion of Canada, the central government at Ottawa was bound to keep up and maintain in proper condition. The Victoria Board of Trade appointed a special committee to look into these complaints, with the result that the commission shows that the Canadian Government has sadly neglected the institution. Apparently the institution owes the Dominion Government nothing, but is in fact a money-maker. During the past five years ending June 30, 1901, the last returns which are available, $18,973.78 was paid for hospital dues by vessels entering at Victoria, while the amount expended during these five years upon the Marine Hospital was only $9,541.63, leaving a profit of $9,432.63.

British Columbia Medical Society.—The fourth annual meeting of the British Columbia Medical Society took place at Victoria, on October 30 and 31, with Dr. O. M. Jones of that city as president. A considerable number of physicians from the neighboring State of Washington was present and joined heartily in the various discussions. The president, in his annual address, dwelt upon raising the stand-

ard of medical education and that all should join in maintaining the noblest ethics of the profession. Among those who contributed papers were Dr. R. E. Walker of New Westminster, who read a paper on Pulmonary Embolism; Dr. Ernest Hall, Victoria, Deductions from the Study of Pelvic Disease in the Female Insane; Medical Ethics, by Dr. A. P. Proctor, Kamloops; Pathology and Treatment of Tuberculous Kidney, Dr. Eagleson, Seattle. The following were the officers elected: President, Dr. A. P. Proctor, Kamloops; Vice-President, Dr. Boyle, Vancouver; Secretary, Dr. Brydone-Jack, Vancouver.

Dispensary for Consumptives in Toronto.—With the concurrence of the medical profession of the City of Toronto, the National Sanitarium Association has decided to establish a free dispensary for outdoor patients in consumption. There will also be established in connection therewith a Medical Hall or Lecture Room, thus affording students full facilities for seeing and studying the disease in all its phases. The officers of the association also announce that the Free Hospital within five miles of Toronto is rapidly nearing completion. This will have accommodation for 50 patients, and when fully completed will cost $50,000.

GENERAL.

The Plague at Rio de Janeiro.—There were 23 deaths from bubonic plague and 66 fresh cases of the disease here during the past week. There are now 130 plague cases under treatment.

A Dispensary in the Desert.—The sanitary department of the Egyptian Government has received from Sir Ernest Cassel a gift of $100,000 for the purpose of establishing a traveling dispensary, constructed in tent fashion, but equipped with the most modern appliances. This dispensary will be transported to all parts of Egypt, including its most isolated desert places; and it is especially dedicated to ophthalmic work, the donor hoping thus to lessen the ravages of the ocular affections which are so widespread among the poor of Egypt.

Typhoid at Williams?—A disease which in some ways resembles typhoid fever exists among the Williams College students, and ten men are already prostrated with it. The physicians at first seemed to think that it was a form of grip, but they now say that it is a form of fever, although they will not admit it is typhoid.

Threatened Diphtheria Epidemic in New Jersey.—In their fight to prevent the spread of diphtheria in New Brunswick, N. J., the Board of Health of that city now find themselves confronted with a great obstacle. They have been expending money to check the disease and have exhausted their entire appropriation, with no prospects of getting any more money for six months. In the meantime there is a great danger of an epidemic of diphtneria. Already this month thirty-five new cases have been reported, while during the entire month of October there were only a total of five new cases reported at the office of the Health Board.

Warren Triennial Prize—Massachusetts General Hospital.—The Warren Triennial Prize was founded by the late Dr. J. Mason Warren in memory of his father, and his will provides that the accumulated interest of the fund shall be awarded every three years to the best dissertation, considered worthy of a premium, on some subject in Physiology, Surgery, or Pathological Anatomy; the arbitrators being the Physicians and Surgeons of the Massachusetts General Hospital. The subject for competition for the year 1904 is on some special subject in physiology, surgery, or pathology. Dissertations must be legibly written, and must be suitably bound, so as to be easily handled. The name of the writer must be enclosed in a sealed envelope, on which must be written a motto corresponding with one on the accompanying dissertation. Any clew given by the dissertation, or any action on the part of the writer which reveals his name before the award of the prize, will disqualify him from receiving the same. The amount of the prize for the year 1904 will be $500. In case no dissertation is considered sufficiently meritorious, no award will be made. Dissertations will be received until April 14, 1904. A high value will be placed on original work.

Cultivation of Protozoa.—At a meeting of the Kalamazoo Academy of Medicine held on November 3, Dr. F. G. Novy presented the results of work carried on, with the cooperation of Mr. McNeal, in the Hygienic Laboratory of the University of Michigan relative to the cultivation of the *Trypanosome* of Nagana or the Tsetse-fly disease of South America. They have succeeded in cultivating this flagellata, *in vitro*, for the past two months (68 days), through six generations. The fresh active cultures reproduce the disease in animals, modified cultures are without virulence and may possibly serve as vaccines. The method of cultivation is the same as that employed for the cultivation of rat trypanosomes, published in the Vaughan *Festschrift*. The rat and *Nagana trypanosomes* are the first pathogenic protozoa cultivated in pure condition outside of the body.

Yellow Fever in Laredo.—The official yellow fever bulletin last week was as follows: New cases, 20; deaths, 5; total cases to date, 768; total deaths, 77. Three new cases have been discovered at the Gannel coal mines, making the total number there 11. Two deaths from yellow fever occurred at Minera Monday, making a total of 10 deaths there to date.

Report of Texas State Health Officer.—Dr. George R. Tabor, the State health officer, has made the following report on yellow fever in Texas: "Actual conditions in Texas are as follows: About 700 cases, with 60 deaths, in Laredo; 18 cases, 8 deaths in San Antonio, with no cases reported in San Antonio for seven days; 5 cases, 2 deaths in Dewitt County. These are the only places of infection in Texas, and this is a true statement of existing conditions. Two frosts have fallen in Bexar and Dewitt counties. Conditions are favorable in Bexar, and I apprehend no further cases. The cases in Dewitt County are confined to one house, with no other house nearer than one mile. The disease is ended there. Laredo is well quarantined. There is no danger whatever to people coming to Texas, as our quarantine will amply protect other sections of the State."

The Huxley Memorial Lecture.—The fourth annual Huxley memorial lecture of the Anthropological Institute was delivered in the theater of Burlington House, London, by Professor Karl Pearson, F.R.S. The president of the institute, Mr. H. Balfour, occupied the chair. The lecturer's subject was "The Inheritance in Man of Moral and Mental Characters," a subject to which he has devoted many years of close and constant study, and the importance of which, as he observed, from a national point of view can hardly be exaggerated. It was a question of vital importance, he observed, as to how far mental and moral characters were inherited as compared with physical characters. Few denied the inheritance of physique in man, as in animals, but few too applied the results of such acceptance to their own conduct in life. We were agreed that good homes and good schools were essential to national prosperity, but were apt to overlook the possibility that the home standard was itself a product of parental stock, and that the relative gain from education depended to a surprising degree on the raw material. Since the publication of Francis Galton's epoch-making books it was impossible to deny *in toto* the inheritance of mental characters.

But it was necessary to go a stage further and ask for an exact quantitative measure of the inheritance of such characters and a comparison of such measure with its value for the physical characters. Accordingly he had some six or seven years ago set himself that problem, which really resolved itself into three separate investigations—namely, a sufficiently wide inquiry into the actual values of inheritance of the physical characters in man, and this was carried out by the measurement of upwards of 1,000 families; a comparison of the inheritance of the physical characters in man with that of the physical characters in other forms of life; and an inquiry into the inheritance of the mental and moral characters in man. In respect of this last set of investigations children were taken in schools of different sorts all over the country, and the opinions of teachers were asked upon the characters of their pupils in respect of the physical, mental and moral resemblances between brother and brother, sister and sister, and brother and sister. Six thousand circulars were thus sent out to about 200 schools. In respect of physical characters the data included the cephalic index—*i.e.*, ratio of the length to the breadth of the head, the span, color of eye and hair, curliness of hair, athletic power and health. In respect of all these the measure of the fraternal resemblance, indicated by the well-known regression line, was as two to one—that is to say, that if one of the pair exceeded the mean by a certain amount, the other of the pair tended to exceed the mean by half that amount; and similarly in respect of defect from the mean. This was always true for all the physical characters yet worked out in man. Now, seeing there was this surprising uniformity in the inheritance of the measurable physical characters, could these results be extended to psychical characters? Could we—that was the whole problem—get a corresponding regression line of two to one in steepness or slope in respect of mental and moral characters. A very large number of observations made on 1,918 pairs of brothers as to vivacity, assertiveness, introspection, popularity, conscientiousness, temper, probity, handwriting and general ability showed that while the line of regression was one to two or 50 to 100 in respect of physical characters, the smaller number was represented in respect of mental and moral characters by 51; while in respect of a large number of pairs of sisters it was 52, and these two numbers tended to approximate to 50 with an allowance for probable error. Hence there could be small doubt that intelligence or ability followed precisely the same laws of inheritance as general health, and both followed the same laws as cephalic index or any other physical character. There was a true line of regression in each case (.5 or 1 to 2), and it could safely be said that general health in the community was inherited in precisely the same manner as head-measurements or body-lengths. What results followed therefrom? By assuming our normal distribution for the psychical characters, there was found, in addition to self-consistent results, the same degree of resemblance between physical and psychical characters; and that sameness involved something additional—namely, a like inheritance from parents. We inherited our parents' tempers, conscientiousness, shyness and ability, even as we inherited their stature, forearm and span. Again, within broad lines, physical characters were inherited at the same rate in man and the lower forms of life. The irresistible conclusion was that if man's physical characters were inherited even as those of the horse, the greyhound or the water-flea, what reason was there for demanding a special evolution for man's mental and moral side? If the relation of the psychical characters to the physical characters was established, what was its lesson? Simply that geniality and probity and ability might be fostered by home environment and by provision of good schools and well-equipped institutions for research, but that their origin, like health and muscle, was deeper down than those things. They were bred and not created. It was the stock itself that made its home environment, and the education was of small service unless it were applied to an intelligent race of men. Our traders had declared that we were no match for Germans and Americans. There did seem to be a want of intelligence to-day in the British merchant, workman or professional man. The remedy was not in adopting foreign methods of instruction or in the spread of technical education. The reason of the result was that the mentally better stock in the nation was not reproducing itself at the same rate as of old; the less able and the less energetic were more fertile than the better stocks. No scheme of wider or more thorough education would bring up in the scale of intelligence hereditary weakness to the level of hereditary strength. The only remedy, if one were possible at all, was to alter the relative fertility of the good and bad stocks in the community. Grave changes had taken place in relative fertility during the last forty years. He ventured to think that we now stood at the beginning of an epoch that would be marked by a great dearth of ability. We had failed to realize that the psychical characters—the backbone of a state in the modern struggle of nations—were not manufactured by home and school and college; they were bred in the bone, and for the last forty years the intellectual classes of the nation, enervated by wealth or by love of pleasure, or by following an erroneous standard of life, had ceased to give us in due proportion the men wanted to carry on the ever-growing work of our empire, to battle in the fore rank of the ever-intensified struggle of nations. The remedy lay first in getting the intellectual section of our nation to realize that intelligence could be aided and be trained, but that no training or education could create it. It must be bred; that was the broad result flowing from the equality in inheritance of the psychical and the physical characters in man, and that result constituted a problem for statecraft to deal with.—(*Science*).

Death of William M. Warren.—In the death of William M. Warren, which took place last week in Detroit, not only the pharmaceutical, but the medical world has lost a very important figure. It is unquestionably true that Mr. Warren was the mainstay in the firm of Parke, Davis & Co., and through his influence has made the scientific pharmacy of this country what it is to-day.

Obituary.—Dr. McFadden Gaston died at Atlanta, Ga., last week of acute indigestion, aged seventy-nine years. He was prominent during the Civil War as a medical officer in the Confederate service. After the war, from 1865 to 1883, he made his home in Brazil, attaining distinction in his profession there. Since 1883 he had been at the head of the department of surgery in the Southern Medical College.

Dr. Charles Marshall, a prominent physician of Huntingdon, Province of Quebec, Canada, died suddenly of apoplexy at 272 West One Hundred and Seventeenth street, on Friday last. Dr. Marshall had arrived in New York two hours before to make a visit to his relatives here. Mr. Moore met him, and at his home he was served with a light luncheon. The attack of apoplexy followed, and was almost immediately fatal. Dr. Marshall was a graduate of New York University, and practised for several years in the hospitals of Paris and Edinburgh, later settling for practice in Huntingdon, his birthplace. He was a member of the Medical Board of Governors of the Province of Quebec, and was prominent in the Masonic Order.

Dr. Hortense A. Miller died at Bellevue Hospital on

Nov. 9, from illness contracted six years ago while she was nursing yellow fever patients at New Orleans. A descendant of the Earl of Clarendon, Mrs. Miller was born in Boston fifty-one years ago, her father being Eliphalet Hamlin and her mother Katharine Hardy, both well known during their lifetime in Boston. She married Edward Miller, a wealthy Boston man, and traveled about the world with him till he died, eighteen years ago. Then she went to the University of Michigan, at Ann Arbor, where she was graduated as a physician, and afterward gave her services and her money wherever they could do the most good.

Dr. George J. Engelmann, one of the best-known gynecologists in the country, died suddenly November 16, from pneumonia. He was born in St. Louis fifty-five years ago, but had lived in Boston for the past six years. Dr. Engelmann was born in St. Louis July 2, 1847. His father was Dr. George Engelmann, and his mother before her marriage was Dora Horstmann. He was graduated from Washington University in 1867. From 1867 to 1873 he studied medicine at Tübingen, Germany, where he took his degree of M.D., and also at the University of Vienna. During the Franco-Prussian war, 1870-71, Dr. Engelmann practiced surgery. From 1873 to 1895 he pursued his profession in St. Louis. In later years he was in Boston, pursuing his specialty. Dr. Engelmann was an extensive traveler, and was deeply interested in archæological and ethnological researches. His collection of Missouri flints and pottery is now in the Peabody Archæological Museum at Cambridge, Mass. He was a professor in the Post-Graduate School of Medicine in St. Louis and the Missouri Medical College until 1894. He was accorded high honors by his colleagues at international meetings of surgeons in Brussels, Amsterdam and Rome.

SOCIETY PROCEEDINGS.

THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

Stated Meeting, held October 12, 1903.

Dr. Thomas B. Futcher was elected president and Dr. C. P. Emerson secretary for the coming year.

Demonstration of Medical Cases.—Dr. McCrae said he desired to show the pathological specimens of a case which had several admissions to this hospital before death. The patient was a colored man, forty-nine years of age, and was admitted complaining of shortness of breath. Three months before admission he had "caught cold" and was still suffering from cough and pains in the chest. Examination showed a lift of the manubrium and an area of dulness in the chest. A diagnosis of aortic aneurism was made. On his second admission he showed the same symptoms, and examination revealed a large pulsating swelling reaching from the second to the fourth rib and far out to the right from the sternum. There was no pulsation or prominence to the left. Suddenly, however, the fulness one day disappeared from the right and appeared on the left. Ten days later the tumor again moved to the right and the heart apex, which had moved far out toward the axilla, came in again toward the middle line. On the third admission the patient showed signs of adherent pericardium and of aneurism on the left side of the sternum. Shortly after his entrance to the hospital the tumor once more moved to the right, where it remained until death. The specimen from the case is that of an anuerism of the aortic arch one inch above the valve. The portion on the extreme right, which corresponds to the area where the pulsating tumor first appeared, is very thin. The pericardium and lungs are very adherent. There is erosion of the trachea, a second small aneurism on the descending arch and a general diffuse bronchiectasis of the left lung. The thinness of the right wall of the aneurismal sac may explain the peculiar change in the physical signs noted before death. The shifting of the tumor, however, might also be explained by the relation which the aneurism bears to the heart, particularly when it is remembered that the heart apex shifted markedly during life. Pressure of the aneurism on a bronchus, with resulting changes in intrathoracic conditions, might also explain the phenomena. Death was due to rupture of the pericardium. X-ray photographs showed a shifting shadow corresponding to the change in the physical signs.

Demonstration of Surgical Cases.—Dr. Follis exhibited the first patient, a woman, aged forty-five years, who was brought to the hospital with a wound in the right lumbar region caused by a 38-caliber revolver. Her last meal had been taken four hours before admission and she was seen two hours after the accident. Examination showed abdominal rigidity, normal temperature and leucocytosis of 30,000. The abdomen was opened through the right rectus and the cavity found full of bloody fluid and bowel contents. Eleven intestinal and 6 mesenteric perforations were found. Two in the cecum and two in the ileum were closed. The portion of gut containing the 7 remaining perforations was excised and the two bowel ends left in the abdominal wall. Patient reacted well and her condition was good for two weeks, but on account of her failing nutrition (due to the loss of fluid matter through the high fecal fistula) an extraperitoneal lateral anastomosis was done by the elastic ligature method. Patient did well and after six weeks the bowel ends were excised and turned in under cocaine. The second case is a colored boy aged ten years, who was admitted with typical signs of peritonitis and of typhoid fever, including a positive Widal. He was immediately explored and an intestinal perforation found about 25 cm. above the ileocecal valve. The ends of the bowel were brought to the abdominal wall and left there. The patient had a postoperative pneumonia of the right side, developed a large abscess of the right thigh, subsequently suffered acute intestinal obstruction due to the omentum and was sick with the measles for one month. The enterostomy wound was finally closed under cocaine and the patient recovered completely. Enterostomy in general peritonitis with distention is not a new procedure, having been done by Coyen of Paris; and from one of the Vienna clinics we are told that a typhoid perforation should never be closed as a rational avenue for drainage.

Dr. McCrae said that Dr. Follis' second case teaches plainly that a typhoid patient should at least have the chance of an operation even when general peritonitis has fully developed. The statistics of this hospital show that about 33 per cent. of the cases recover with operation.

Ascending Renal Infection, with Special Reference to the Reflux of Urine from the Bladder into the Ureter as an Etiological Factor in its Causation and Maintenance.—This was the text of Dr. Sampson's paper, who said that in radical operation for uterine cancer the question arises, What should be done with the ureter? and to answer this one must understand the pathology of kidney infections. There are three avenues of infection of the kidney. First, the blood vessels. Experiments in dogs, in which the ureter was ligated, have shown that pyonephrosis may develop from the injection of staphylococci into the injured bladder; and hence a hematogenous ascending renal infection is a possibility. The anastomosis between the renal, uterine, ovarian and vesical arteries offers also a chance for blood infection of the kidneys. Organisms may, in

addition, enter through the ureteral artery which connects directly with the renal circulation. Second, the lymphatics. Dr. Sampson's experiments on this point have been negative. Third, the lumen of the ureter. The anatomy of the intravesical portion of the ureter shows that its oblique course through the bladder wall and the prolongation of its anterior lip to form a valve, offer, in the distended bladder, a natural obstacle to the back flow of urine. In a contracted bladder, however, the course of the ureter is less oblique, the ureteral valve is less prominent and the prevention of reflux is due to a puckering of the bladder mucosa. The state of distention or contraction of the bladder changes the ureteral orifice and consequently the chance of a reflux of urine. My experiments and cystoscopic examinations show that the ureter undergoes contraction so long as fluid flows through it and that the ureteral orifice draws back just after the expulsion of the urine stream into the bladder. Infection may reach the kidney by way of the ureter from the following causes: (1) Injury to the ureteral orifice. He has had several clinical cases in which infection has probably taken place in this way. (2) By extension of the inflammatory process from the bladder wall. This is most frequently the case. One of his patients developed a renal infection from a cystitis due to a retention catheter. (3) Motility of organisms. (4) Backflow of urine, which may be caused either by increased bladder pressure or reversed peristalsis. The experiments on this subject are somewhat contradictory, but I believe that urine flows back through the ureter only when there is disease of the ureteral orifice. Experiments, clinical observations and autopsy findings warrant this assertion. His work leads him to believe that indiscriminate hydraulic distention of the bladder for cystitis is a dangerous procedure, and that ureteral catheterization through an infected bladder should not be done. The most rational treatment for cystitis is the formation of an artificial vesicovaginal fistula which rests the bladder and cures the ureteral stricture. A retention catheter is a dangerous instrument, because it may act as a foreign body. A study of the anatomy and pathology of the ureter shows that this tube not only carries urine from the kidneys to the bladder, but is also of value in absolutely preventing flow in the other direction.

Dr. Russel said that Dr. Sampson's work has many practical sides. Cystitis is the bête-noir of gynecology and this paper has told a great deal about its etiology.

Dr. Young said that he reported some experiments as to the presence of the ureteral reflux in the cadaver and in dogs. Many severe cases of cystitis were, at this time, treated on the surgical side of the hospital by the method of distention—after the safety of this procedure had been demonstrated experimentally on dogs. The results were uniformly good—in one case remarkable. In the past six years he has treated many contracted bladders by hydraulic distention without a sign of ureteral reflux and no symptoms of renal infection. In the Musée Guyon, last summer, he found one case of ureteritis in which the orifice of the diseased ureter was wide open and in this case the fluid would unquestionably flow up the ureter, just as Dr. Sampson has demonstrated in two of his patients. In such cases, however, the kidney and ureter are already diseased and in Dr. Young's opinion the upward flow of any antiseptic fluid would cause no additional injury but might be of benefit, being analogous to Dr. Kelly's method of irrigating the pelvis through the renal catheter. He is glad that Dr. Sampson has come to the same conclusions he himself reached and has also taken his stand against the work of several European investigators, who have attempted to show that a ureteral reflux may be present in normal cases. If hydraulic distention is given up, because of rare ureteral disease, a miserable class of unhelped patients is left.

Dr. Hunner said he has seen a case of what was apparently renal infection following closure of vesicovaginal fistula. Possibly in this patient the bladder became distended during sleep and a reflux of urine took place. Another patient of his, with a stricture of the ureter has frequent attacks of renal infection, which always occur at night—possibly for the same reason.

Dr. Sampson said that in the autopsy room in ordinary cases it is, as Dr. Young says, impossible to force urine from the bladder through the ureteral opening, but by hardening the orifice with formalin, thus simulating ureteral disease, he has been able to cause a reflux.

Stated Meeting, held October 26, 1903.

The President, Thomas B. Futcher, in the Chair.

Some Recent Cases of Extra-uterine Pregnancy.—Dr. Cullen said that extra-uterine pregnancy has recently, in the Johns Hopkins Hospital, been more frequent than usual; and probably many cases have in the past been overlooked. The first patient was a woman of thirty years, who was nursing her child and hence gave no menstrual history. The symptoms were pain in the left side, absence of temperature and a palpable mass which was movable. She made a good recovery after operation. The second patient had no symptoms until a sudden collapse and two similar attacks several weeks later. There had been no hemorrhage and no temperature. The pelvis was found full of blood. The third patient showed the classical symptoms of collapse, pallor, distention, hemorrhage and a palpable mass. The fourth and fifth cases were characterized by labor-like pains, and in the last patient of the series the diagnosis was somewhat difficult because she was at the time nursing a ten-months' child, and the mass in the pelvis suggested a myoma. The pathological specimens from these cases showed both extremes of tubal distention.

Dr. Osler said that these cases are often seen at post-mortem and some years back the diagnosis was practically never made, tubal pregnancies being always called pelvic hematoceles.

Dr. Cullen said that careful descriptions of this condition occur in the French literature before 1800, but Lawson Tait was the first to call careful clinical attention to extra-uterine pregnancy.

A Case of Typhoid Arteritis.—This subject was introduced by Dr. W. R. Steiner. The patient was a boy aged nine years. He complained of headache and weakness, but had had no nose bleeds, nausea, vomiting or diarrhea. His temperature was 101.8° F., pulse 100, Widal reaction negative. Rose spots appeared later and the spleen became palpable in three days. On the twenty-second day of the disease the temperature had fallen to 99.2° F. The next day, however, it reached 103.8° F. and there were all the symptoms of a relapse, with marked delirium, but the temperature reached normal on the thirty-ninth day. On the forty-first day numbness and tingling of the right index finger appeared and gradually the pulse diminished in the right radial artery. There were tenderness, hardness and redness along the vessel and the hand was cold and cyanotic. The fever ran a most discouraging course, bronchitis, a relapse and marked emaciation with delirium being the untoward features. The cyanosis of the arm, however, gradually disappeared and thirty-five days after onset of the arteritis the pulse returned in the right brachial and axillary arteries.

Dr. Thayer said that several similar cases have been reported from the Johns Hopkins Hospital. In one patient the left femoral was involved and in another

an arteritis of the middle cerebral artery was found post mortem. One patient, a girl of eight years, suddenly became unconscious and showed rigidity of the neck with a typical syndrome of Weber, since which time she has had attacks of Jacksonian epilepsy pointing to thrombosis of a cerebral artery.

Dr. Futcher said that Keen collected in his monograph 115 cases of arterio thrombosis and 46 cases of subsequent gangrene.

The Treatment of General Infections, with Especial Reference to the Use of Silver Nitrate in Such Cases.—This was Dr. Joseph Hume's subject, who said that the surgical treatment of general infection aims at free drainage, stimulation and increased elimination. The injection of salt solution, the administration of antitoxines and the introduction of antiseptics into the blood illustrate these fundamental principles. It has often been observed that infection causes a rise in the leucocyte count. It, therefore, seemed that possibly an effort artificially to increase the white blood count was indicated. Silver nitrate has this effect and hence it has been used in the treatment of infections. Possibly it does good by destroying the blood corpuscles and setting free antibodies. If so, a new principle in therapeutics has been established, namely the introduction into the blood of a hemolytic agent. In the series of cases here reported one c.c. of a 10-per-cent. solution of silver nitrate was mixed with 1,000 c.c. of water. Of this mixture 500 c.c. was injected intravenously at a temperature of 110° to 115° F. A chill, rise in temperature, marked drop in the leucocytes, followed by profuse sweating were the phenomena observed in all cases. Several characteristic cases were reported. The first was a girl, aged 16 years, suffering from streptococcus infection following an appendectomy. The usual surgical treatment did no good, the patient became extremely toxic, but following two injections of silver nitrate recovered completely. The second was a patient with a large peritoneal abscess, probably a general peritonitis. She was weak and irrational, and became rapidly worse in spite of treatment. The temperature had reached 104° F. Silver nitrate was given three times with the usual subsequent phenomena. After each injection there was some improvement and the patient was finally discharged well. Another case of streptococcus infection, very toxic and delirious, was similarly treated and after the third injection made a perfect recovery. Ten cases of pyogenic infection have been treated by Dr. Hume with silver nitrate. He has had but one death and that from intercurrent infection. No local results have been observed except two cases of mild phlebitis.

Dr. Pancoast said that Dr. Hume's cases had all been given up, so his material was not promising. The destruction of blood is the only result which silver nitrate has in common with salt solution and formalin, hence this may explain the effect of these agents in infections.

Dr. Thayer said that there is nothing in the literature to support the theory that destruction of leucocytes sets free antibodies. The relation between leucocytosis and prognosis was long ago made the basis of treatment by the administration of turpentine in pneumonia. The reappearance of an excess of leucocytes is according to Weigert's law of the tendency of the human body to overproduction. Theoretically it is poor therapeutics to attempt to destroy the blood of a patient whose powers are already being severely drained. Practically this method of treatment has apparently done some good, but very positive experimental evidence is necessary to make it of general use.

Dr. Cole said that it should be remembered that many cases of streptococcus infection recover without treatment. In a series of 49 cases of general infection, 19 from which the streptococcus was isolated, got well; and this summer in the Johns Hopkins Hospital a patient desperately ill with streptococcus infection suddenly began to improve and made a perfect recovery.

Dr. Emerson said that ordinary salt solution, even though not perfectly isotonic, is *not* hemolytic. Hence it does nothing but good to the blood corpuscles. The blood therefore is not laked and the apparent destruction of white blood corpuscles is really only a leucopenia. If blood were actually destroyed by silver nitrate injection restoration would not be so rapid as it has seemed to be in Dr. Hume's cases.

Dr. Reik stated that one of the cases in Dr. Hume's series had come to him first with a general infection following thrombosis of the lateral sinus. Patient was *in extremis* and had been given up, metastatic abscesses having already formed. Improvement and recovery followed the use of silver.

Stated Meeting, held November 2, 1903.

The President, Thomas B. Futcher, in the Chair.

Exhibition of Medical Cases.—Dr. Cole presented three cases of typhoid fever with meningeal symptoms. The first patient showed contraction of the neck and muscular rigidity and typhoid bacilli were isolated from the cord. In the second case lumbar puncture was done with subsequent improvement. From the spinal fluid which was under tension typhoid bacilli were isolated. Later they were obtained from the blood; and, following a furunculosis, staphylococci also appeared in the blood. This is the only case of secondary blood-infection which has occurred during typhoid fever in the Johns Hopkins Hospital. The third patient had a severe attack of typhoid with bronchitic and meningeal symptoms. Typhoid bacilli were isolated from the spinal fluid. Cases of prolonged fever with nervous symptoms should always make one think of typhoid fever and lumbar puncture is indicated.

Dr. MacCallum showed the pathological specimens of the third case reported by Dr. Cole. There was a distinct exudate over the brain and cord. The gall-bladder was distended, covered with exudate, filled with a suspension of typhoid bacilli and in two places had perforated. This feature would seem to indicate that operation in typhoid cholecystitis is indicated.

The Late Effects of Typhoid Fever on the Heart and Blood-vessels.—Dr. Thayer reported the results of his studies made during the past two years on the vascular features of typhoid fever. The acute vascular conditions such as thrombi, etc., are well enough known, but the relation of typhoid to arteriosclerosis has never been fully worked out. Landouzy, however, holds that typhoid fever is next in importance to rheumatism in producing angiocardiac changes. Dr. Thayer had examined 182 patients who had had typhoid fever from one month to eighteen years previously. In 60.4 per cent. the pulse varied from 60 to 90 and in 30 cases it was somewhat irregular. The blood-pressure was in all cases somewhat high, and over 50 per cent. of the cases over twenty years of age showed palpable arteries. A series of observations was made on the blood-pressure of 276 normal individuals and the average was somewhat lower than in patients who had had typhoid fever. In another series of observations in normal individuals the percentage of palpable arteries was also somewhat smaller than in the typhoid cases; 46.4 per cent. of the cases showed cardiac murmurs, 6 patients having mitral insufficiency and one showing the rare condition of aortic functional disease. Eighty-two cases showed reduplication of the second sound and there was one case of mitral stenosis and one of marked arteriosclerosis.

Dr. Emerson reported an analysis of a thousand cases of albuminuria and stated that his study confirmed Dr. Thayer's opinion of the effect of typhoid fever on the arteries. Strange to say, however, the analysis shows that it has not much effect on the kidneys though the opposite would be expected. Dr. Thayer called attention to the fact that albuminuria is almost constant in typhoid fever, but however bad the urine, the clinical symptoms of nephritis are rarely seen.

Dr. Reik reported a new remedy for tinnitus aurium. The origin of this condition has never been clear though it has been supposed to be due to an increase in intralabyrinthine pressure and resultant stimulation of the auditory nerve. Dr. Reik's experiments on dogs showed that any irritation of the sensory nerve in the ear caused a depressor effect which is contrary to the usual law. These results confirm Dr. Theobald's theory that tinnitus aurium arises from vibrations starting from the blood-vessels. With the idea of raising blood-pressure suprarenal extract was employed by Dr. Reik both locally and internally. Thirty-five cases were reported cured, most of them rapidly, 15 were improved and only one showed any bad effects.

Dr. Burnam showed the pathological specimens of four rather unusual appendices. The first was from a colored woman aged twenty-eight years who had had an abdominal tumor without temperature. And abscess with infiltrated walls formed in the abdominal wall and scrapings from it showed large numbers of the ray fungus. At the second operation the appendix was found to be the cause, death ensued and at autopsy the appendix showed marked submucosal thickening. There were abscesses also in the lungs. An interesting feature of the case was that the leucocytes never rose, though the temperature reached 106° F. A case of primary carcinoma of the tip of the appendix and two cases of primary tuberculosis of the appendix were also shown and Dr. Burnham stated that these cases gave one more reason for the need of early operation, even in chronic appendicitis inasmuch as the appendix in these cases may be the site of some very severe condition.

NORTHWEST MEDICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, held October 6, 1903.

The President, A. C. Buckley, M.D., in the Chair.

Lobar Pneumonia, Delayed Resolution, Recovery. Hemiplegia, Partial Recovery.—This paper was read by Dr. Harry Lowenburg, in which he reported the case of a boy, seven years old, giving a negative family history, with the exception that his father was an alcoholic and that there was some evidence of Bright's disease on the paternal side. His previous personal history was good, excepting that he had suffered from an attack of varicella a few weeks previous to his present illness, which began with fever and general prostration, and the attending physician diagnosed as typhoid, and when he was admitted to the hospital three or four days after the beginning of the attack he had a temperature of 104° F.; pulse 124, and respirations 24. There was the usual phenomena attendant upon marked febrile movement, slightly coated tongue, constipation, restlessness, hyperesthesia and exaggerated reflexes, but physical examination of the lungs, heart, liver and spleen was negative; there was no tympanitis, and no skin eruption and the Widal and diazo reactions were negative. The following day the respirations had increased to 44 and the pulse to 140, and there was complete dulness and vocal resonance and vocal fremitus over the right intrascapular space and over the anterior aspect of the right apex, at which time a diagnosis of acute lobar pneumonia, involving right apex and entire posterior aspect of the right lung, associated with dry pleurisy, was made. At 3 A.M., on the day following his admission, the temperature fell from 104½° to 98⅘°, F., the pulse and respiration remaining at their previous rate, and the temperature rising to 105° F. at 6 P.M. At this time a blood examination showed red blood cells, 3,100,000; white blood cells, 15,000; hemoglobin, 62 per cent. His temperature continued high until about twenty days after his admission, when it fell to normal, and at this time for about three days he had slight hemorrhages from the lungs. A few hours following the fall in temperature there was complete palsy of the right arm and leg and right side of the face in the lower half, although he could open and close his right eye, and there was incontinence of urine and feces. For three weeks his condition remained about the same, although the auscultatory signs of consolidation improved somewhat. Several exploratory punctures were negative and the sputum showed absence of tubercle bacilli. Gradually the pneumonia disappeared, his appetite improved and he was placed on solid diet, and about six weeks after the beginning of the attack was sent to the country in a weak and emaciated condition, still suffering from incontinence of the feces and urine. He was ordered plenty of fresh air, sunshine, electricity, massage, inunctions of blue ointment, and KI, grs. v., and bichloride, gr. ½, t.i.d, and four weeks later he was able to move his arm and leg somewhat, and at the present time, about five months and a half after the commencement of the attack, is able to walk, although showing considerable defect; can raise his arm almost as high as his head; his face still shows some slight effect, although his speech is apparently perfect and his bodily nutrition has improved. There is still drooping of the right shoulder and restricted movement of the right chest, probably due to pleural adhesions. The author felt that the hemiplegia was due to an embolism, probably originating from the resolving lung.

Dr. Luther C. Peter referred to the fact that hemiplegia occurs considerably in the infectious fevers, particularly typhoid, coming on usually during convalescence, when the circulation is exceedingly slow, and being usually due to a thrombosis. In the present case, however, he felt that the sudden onset pointed to an embolism.

Dr. J. Thompson Schell felt that both the symptoms and the sequelæ pointed to embolism.

Dr. M. P. Warmuth reported a case of lobar pneumonia of the right lung, occurring in a child, in which during the last week of the convalescence the child was entirely blind, lasting a week or ten days, after which the symptoms entirely disappeared, the temperature range being similar to that reported by the author. He felt that the case reported was caused by an embolism, and reported a case following diphtheria, in which there was complete paralysis of the right side for six to eight hours, and for the following thirty-six hours the right radial pulse could not be felt, after which, however, it returned.

Dr. A. C. Buckley reported the work of a German observer, who had recorded seven cases of hemiplegia following infectious fevers, excluding pneumonia and scarlet fever, all followed by autopsy and showed no meningitis present, the condition being attributed to change in the blood-vessels.

A Case of Ludwig's Angina.—This paper was read by Dr. C. M. Harris, in which he stated that the disease was generally supposed to be a streptococcus infection about the submaxillary gland and alveolar tissue, beneath the mucous membrane in the floor of the mouth, as a result of which there is cellulitis about the gland

tending to sloughing rather than pus. The symptoms are local discomfort, followed in from two to four days by swelling and pain; pressure causing considerable dysphagia and sometimes salivation and dyspnea. In some cases there is a high temperature and symptoms of septicemia, pyemia, or even gangrene, may be present. The treatment should consist of prompt incision and removal of any gangrenous tissue, followed by the application of carbolic acid and constitutional treatment, as indicated for septicemia. He reported a case in which a patient had gone to a public bath and remained in the water for two to three hours, and the following day complained of some pain in the right ear and some swelling in the right submaxillary region. The symptoms increased and on the third day there was a hard, tense swelling in the submaxillary region about the base of the tongue which was unattended by external redness or any heat. It was difficult to open the mouth and there was a thick coating on the dorsal surface of the tongue and some of the buccal mucous membrane. There was edematous swelling about the frenum and the submaxillary and sublingual ducts were quite prominent. The temperature was 100° F. On the evening of the fourth day the swelling had extended posteriorly, beyond the angle of the jaw, and the pain in the ear was almost intolerable. An opiate was given, under the influence of which the patient passed a comfortable night. On the fifth day the swelling and pain began to diminish and on the seventh day had practically disappeared, the tongue cleared, the mouth could be opened fully, and presented nearly normal appearance. On the ninth day there was a discharge of pus from the affected ear, which continued for about a week, when it ceased and the patient has since enjoyed good health. The constitutional treatment consisted of quarter-grain doses of calomel hourly for eight to ten hours during the first four days of the disease, and local applications of peroxide of hydrogen and other antiseptic solutions.

Dr. Justice Sinexon reported a case of cervical cellulitis, occurring in an engineer, whose run required him to be absent for two days each trip. On the way out one day he noticed that his neck was stiff, and the following day he presented all the symptoms of the "stiff collar" appearance of the neck. He had much difficulty in swallowing and speaking, and the swelling was most marked at the angle of the jaw. He was given one-tenth-grain doses of calomel every hour for four or five days. On the fifth day an incision was made in the floor of the mouth without any result, which, after the application of belladonna ointment, was followed by the discharge of a small amount of pus and the man made a good recovery.

Dr. William L. Pepper referred to the frequency of the occurrence of cellulitis during epidemics of influenza, as well as in cases of peridermitis, which he ascribed to the infection traveling through the glands.

Dr. T. Turner Thomas reported a case in which the incision had been made on about the seventh or eighth day of the disease, followed by hot applications of bichloride. The patient had considerable dyspnea, which increased after the operation, and during a severe attack, a tracheotomy was attempted, but before it was performed the patient died. He felt that the danger in this condition was principally due to the fact that it involved the deep structures, the least resistance being in the direction of the mouth and throat. He recommended the employment of early free incision, and believed that the prognosis was also dependent upon the kind of infection.

Dr. Harris, in closing the discussion, said that there was probably some danger in the conservative treatment, and that radical measures were probably the surest means.

THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, held at the New York Academy of Medicine, October 12, 1903.

The President, Andrew H. Smith, M.D., in the Chair.

Vacation Odds and Ends.—The President, Dr. Smith, gave some observations at the International Medical Congress, at Madrid, and elsewhere in Europe during a trip from which he had just returned.

The Fourteenth International Congress.—The success of the Congress, he said, was all that could have been expected under the existing conditions. In the midst of so many counter-attractions, it was no wonder that science fared rather ill and that the central idea of the meeting was measurably lost sight of, while its festal side assumed undue prominence. A serious obstacle to the success of international gatherings in general was especially accentuated in this. At the Congress held at Rome there were four official languages; at the Madrid Congress Spanish was necessarily added, and as rather more than one-half of all the congressists were Spanish, it followed that three out of every five papers were in that tongue, the least understood by foreigners. It seemed to him that in future the official language would have to be restricted to one or two of those most generally understood, or the whole scheme of international congresses would degenerate into a Babel which would result in its abandonment. At the opening of the Congress 1,681 papers were announced on the official program. These were apportioned among 16 different sections, making an average of 105 to each section. Of course, this meant that by far the greater number could be read by title only, and many did not receive even this scant measure of recognition. Dr. Smith thought it would be better if in the future a strict censorship were exercised by a committee of the best available men, and only a relatively small number of the highest class of papers admitted to a place on the program. At present all papers presented were accepted.

Medical Education in Italy.—The degree of M.D. is conferred by 17 universities and by the Royal Institute of Florence. The course extends over a period of six years, and cannot be shortened by extra diligence and application. A large amount of scientific work is done in the laboratories of the universities, and much of it is of a very high quality. At Rome there are about 650 medical students. The amount of clinical material is very great, but its utilization is at present handicapped by antiquated buildings very imperfectly adapted to teaching purposes, the magnificent new Policlinico being still uncompleted. Rome, formerly considered one of the most unhealthy cities in the world, presents now a death-rate smaller than that of New York. (In 1902, 16.9.) This has been effected (1) by restraining the Tiber between embankments and (2) by increasing the water supply, which comes from an unimpeachable source in the Alban Hills, and at the same time summarily filling in the polluted wells.

The Allgemeine Krankenhaus in Vienna.—This, the largest hospital in the world, with 4,000 beds, comprises a large number of buildings, none of which are modern. Modern requirements have been met as far as possible by alterations and adaptations, but the only possibility of bringing the institution into line with the demands of the day is by demolition and reconstruction. The Vienna Polyclinic, though more modern than the Krankenhaus, seems to American eyes much behind the times; we miss the appearance of neatness and absolute cleanliness to which we are accustomed. In one respect there is a decided lack: the nurses are not trained up to our standard, and the evidences of slovenly work are apparent on every hand. This was more or less true,

indeed, in all the hospitals Dr. Smith has seen in Europe. Nevertheless, as all the world recognizes, excellent work is done in the hospitals and clinics of Vienna. A low valuation of life appears to prevail in the public institutions, and this impressed him particularly at the Polyclinic, where patients and cadavers seemed to be regarded in much the same light as "teaching material." He learned from an American nurse that she was told, in answer to her inquiry, that diphtheria antitoxin was seldom used in the children's hospitals, as it was too expensive.

Finsen's Clinic at Copenhagen.—The building was erected expressly for this purpose about three years ago, and its main feature is the great operating room, in which are 27 tables for the accommodation of patients while undergoing treatment with the Finsen light. These tables are fitted up with every form of adjustment that can make the patient more comfortable during the application, which lasts from an hour to an hour and a half. Prof. Finsen observed that the effect of the rays was greatly increased by expressing the blood from the capillaries of the part operated upon, and this is done by pressure with a convex lens fitted into a ring attached to a handle. Above the lens, and set in the same ring, is a plain glass; between the glass is a space filled with circulating water, to keep the rays comfortably cool. By the use of suitable diaphragms the action is confined to a small space at a time. The treatments are repeated daily, and during them the nurse presses the lens so firmly upon the part as to completely empty the capillaries. As the period of treatment often extends over many weeks, or even months, the patience required is enormous; but for those who endure to the end the reward is usually great, as even the most inveterate and heretofore incurable cases result in a large percentage of cures. Besides the large operating room there are several small rooms, each with a single light, which are used for pay patients. Persons come for treatment from all over the world. Dr. Smith saw a number of patients who are practically well, and also photographs of the same cases at the time treatment was commenced. A large number of cases are of lupus. He asked the chief of clinic in what proportion of these there was an underlying tuberculous element, and was told in probably about 60 or 70 per cent. of the cases.

"Hydrophobia and That Sort of Thing."—This was the title of a paper by Dr. Reynold Webb Wilcox, in which he gave a report of the reputed cases of hydrophobia in the City of New York during 1902 and 1903, and also described a recent visit to the Pasteur Institute in Paris. In June last, he said, at a hearing before a committee of aldermen upon a proposed ordinance concerning the muzzling of dogs, the statement was made that in 1892 and up to that time in 1903 there had been ten deaths from hydrophobia. As the subject was one which commanded but little attention from the physician, he thought it opportune that it should be reinvestigated, so that some definite conclusion might be reached. Doubting the accuracy of the statement referred to, he requested from the Department of Health a list of those who were alleged to have died from hydrophobia during the time specified, with such other data as would enable him to prosecute his inquiry. This request having been courteously granted, he sent to each coroner or physician certifying to the death a letter containing a list of inquiries into the character and history of the case met with. Seven of the ten deaths were coroners' cases. In one of these the patient, a man thirty-two years old, was bitten in the right hand (wound cauterized), and symptoms developed after nine weeks. A post mortem was made, but the report of it is not on file. In another, the patient, a girl of nine years, who had been bitten some months previously, did not show any symptoms until just prior to death, when she developed convulsions, and died in them. There were no symptoms or history of hydrophobia and no evidence that the dog was mad. In a third case the patient, a woman sixty-two years old, was bitten in the right foot about three weeks previously. She took eighteen treatments (Pasteur), later was taken ill, and died after two days. The dog was shot on the same day he did the biting. In the other coroners' cases no evidence was obtainable. Of the three cases which were not coroners' cases, in two there was no conclusive evidence which he could obtain. The remaining case, in which the patient was placed under careful observation and in which the details were given, was the only one, Dr. Wilcox said, whose record needed analysis. The points militating against a diagnosis of hydrophobia were as follows: (1) The development of the symptoms twenty-four days after the bite is decidedly early; (2) leucocytosis can be accounted for as an ante-mortem phenomenon; (3) respiratory spasm is quite as common in tetanus as in various other conditions; (4) the temperature in tetanus, as here, usually remains low until just before death; (5) the mental symptoms are those usually found in tetanus; (6) inoculation experiments are not conclusive unless carried further than is stated. In the absence of more definite information, the diagnosis would more logically be tetanus than that stated. The most that can be claimed for these cases is that the diagnosis of hydrophobia is not proven. In some instances there is no evident reason why that diagnosis was assumed. Having given an account of a visit which he paid to the Pasteur Institute in Paris during the past summer, he gave the statistics of that institution since 1886. During 1902 1,106 persons were treated, of whom three died from hydrophobia. Inasmuch as in one of these the disease declared itself before the end of treatment, this case was excluded from both "persons treated" and "deaths." The deductions he derived from the table were: (1) Evidently the material used is prepared with great care; else in the presence of conditions favorable to sepsis (as observed by Dr. Wilcox at the Institute), more frequent indurations would result. (2) The patients are evidently cautiously selected, and the Institute has profited by the experience of the first three years, when the mortality was quite large.

Anyone reading the various papers on hydrophobia must have been impressed with their sameness, and a few years ago Dr. Wilcox discovered the common source of information or misinformation upon this subject. This was Van Swieten's Commentaries on Boerhaave, the Ziemssen of the eighteenth century, and in a chapter on "The Canine Madness" are to be found every fact and fancy, theory and superstition one is likely to need. He quoted a portion of this and then went on to say, "Having then found the source of information, and in one sense the forbear of the modern treatment of conditions of alleged sequence to dog-bite, may we not hope that less of assumption and more of logic shall enter into future discussions? A healthy skepticism as to the existence of hydrophobia as a nosological entity does not imply a negation of what has been accomplished by antitoxins or attenuated cultures (vaccines), for these have been demonstrated and their results proven. . . . However, the verdict deduced from the present inquisition, as it was from the one which I prosecuted in 1894, must be the Scotch one of "not proven."

A Mad Dog Scare.—Dr. Elmer Lee said he had visited the Pasteur Institute in Paris, as well as the great experimental institute at St. Petersburgh, and he could confirm all that Dr. Wilcox had said. Some years

ago there was a mad dog scare on Staten Island, and the dog, which was said to have bitten five persons, was kept under observation by the Society for the Prevention of Cruelty to Animals until it died, a few days afterward. An autopsy was made on it at the Loomis Laboratory by Dr. H. P. Loomis and Dr. Lee, and its stomach was found to be filled with curled hair from a cushion, which it had chewed in a barn in which it had taken refuge from a crowd of people who were pursuing it. In the heart there were 60 to 70 worms, which were some five to six inches long, and about the thickness of an old-fashioned metallic knitting-needle. Neither the brain nor the spinal cord presented any pathological condition. As a result of the examination they reported that there was present no post-mortem evidence whatever of the existence of rabies. Yet, in spite of this finding, the health authorities declared that the dog had died of rabies, and insisted that the persons bitten should undergo the Pasteur treatment. Personally, Dr. Lee had never seen a case of hydrophobia, and he should like to inquire if any member present had met with a single well-authenticated case.

The Existence of the Disease a Scientific Fact.—Dr. James D. Trask asked if he was to understand that there is no such thing as hydrophobia. He was surprised at the position which appeared to be assumed. He himself had seen and treated hydrophobia, and the existence of the disease as a scientific fact had been so conclusively demonstrated that he could not see how anyone could doubt it.

Hydrophobia at Least More Rare than Generally Supposed.—Dr. R. E. Van Gieson said that if he correctly understood the purport of the paper, the question had not been raised as to the existence of such a disease as hydrophobia. The author, however, did claim, and to a certain extent at least had proved, that hydrophobia does not occur as frequently as is commonly supposed to be the case. From his own experience he could say that he had seen persons treated by the Pasteur method who did not have hydrophobia. We do assert this much, he said, that hydrophobia is decidedly more rare than many would have us believe, and that the public has undoubtedly been misled in this matter. During a general practice extending now over nearly fifty years he himself had never seen a case. He had been called to see cases which were said to be hydrophobia, but which were really not the disease. Of two such cases, one was tetanus. The other was hysteria, and the patient got well. He had met with many instances, however, in which persons were bitten by dogs said to be rabid. He thought we might safely say that there is a disease given by the saliva of the lower animals, yet its symptoms were so irregular and its period of incubation so indefinite that much uncertainty existed regarding it.

Hydrophobia a Real Disease.—The President, Dr. Andrew H. Smith, related two cases he had seen at Bellevue Hospital, which were supposed to be rabies, and also spoke of the death within a period of three or four months, of 24 out of a flock of 48 sheep on a farm, which had been bitten by a rabid dog. It seemed to him that there were only two things which might be mistaken for hydrophobia—namely (1), tetanus, and (2) nervous exhaustion from fright (lyssophobia). As regards tetanus, he did not know of any case of the disease occurring where all signs of traumatism had disappeared for a considerable time. It was unfortunately the case that a dog which had bitten one or more persons was generally killed immediately, instead of being kept shut up under observation. In this way it was often impossible to say whether a dog had rabies or not, and those who had been bitten were thus apt to become the victims of their own terrors. He, therefore, considered it a crime to kill a dog under these considerations, and would have it made a State prison offense. He could not doubt that there was really such a disease as hydrophobia, and repeated instances of it were recorded in medical literature. Children had suffered from it who were too young to be affected with lyssophobia. Again, the inoculation from the medulla of animals and the reinoculation to the third or fourth series seemed to establish its entity on a scientific basis.

Dr. Wilcox, in closing the discussion, said he did not wish to be considered an iconoclast. He had not denied the existence of hydrophobia, and he did not wish any one to go away under that impression. All that he claimed was that as regards his investigation in 1894, when he collected 17 cases, and when he first visited the Pasteur Institute in Paris, and also his present investigation with 10 cases and a second visit to the Pasteur Institute, the verdict was that of "not proven." He himself, while working, in 1882, in a laboratory in Paris had been severely bitten in the finger by a rabid dog, and he bore the scar to this day. The wound had been treated only by ordinary methods, yet he had not developed hydrophobia; and he could give a number of similar instances. As to the presence of worms in the heart of the dog examined after death by Drs. Loomis and Lee, he believed this was quite a common occurrence with dogs. He would like to ask Dr. Ellis if this were not the case. (Dr. Ellis replied that it was.) Dr. Van Gieson, he thought, had stated the case very fairly. As to the inoculation of guinea-pigs and other animals, one series was not conclusive; for it had been shown that various powerful drugs, such as strychnine and atropine, were capable of producing symptoms identical with what is known as dumb rabies, the special manifestation of which was paralysis of the hind legs. To prove anything of scientific worth, the inoculations must be carried through successive series. Personally he had seen two cases which had been diagnosed as hydrophobia; yet one of them, in a child, was shown by the autopsy to be a case of tuberculous meningitis, and the other, in which there were multiple abscesses, was undoubtedly one of septicemia. In his analysis of case No. 3 in the paper he had purposely omitted to mention the strongest point against its being an instance of hydrophobia in order to keep this in reserve in case anyone during the discussion should dispute the position which he had taken in regard to it. Van Gehuchten and Nélis maintained that in hydrophobia there was in the spinal and peripheral cervical ganglia, particularly the intervertebral ganglia and the plexiform ganglia of the pneumogastric, a destruction of the larger nerve cells, brought about by the migration of new cells from the capsule; these new cells invading the protoplasm and the nerve cells, and finally occupying the whole capsule. Ravenal and McCarthy claimed that these changes, with the clinical manifestations of hydrophobia, give a rapid and immediate means of diagnosis, but stated that their absence does not exclude hydrophobia. Delafield and Prudden denied that there are any characteristic changes in the disease. Finally, we come to Marinesco, who had demonstrated that the *Bacillus botulismus*, which is found in sausage poisoning, is capable of producing the same changes as those described by Van Gehuchten and Nélis as pathognomonic of hydrophobia. Furthermore, that the toxin developed is closely allied in its pathological results to that met with in diphtheria and tetanus. At present, therefore, Dr. Wilcox said, he thought it could be safely stated that there was no pathological anatomy of hydrophobia. How, then, he asked, could the disease be identified? As to the cases which he had studied, he could only say again that no other conclusion could be reached than that for these cases the finding must be "not proven."